

Lean NCC hurts sponsors

AFIPS feels pinch; others' cuts scattered

By David A. Ludlum

The unexpectedly lean turnout for this year's National Computer Conference (NCC '86) has crimped the budgets of the four professional associations that split a one-half interest in the show.

The groups have also suffered other shortfalls in projected revenues for current or recently ended fiscal years due to the slowdown in the computer industry.

NCC is half-owned by the American Federation of Information Processing Societies (AFIPS), which has scaled back activities and contributions to other groups due to the decline in attendance at the show [CW, Aug. 18].

The remaining ownership of NCC is divided among the Association for Computing Machinery (ACM), the Data Processing Management Association (DPMA) and the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE-CS), which each hold a 15% share, and the Society for Computer Simulation (SCS), which owns 5%.

Unlike AFIPS, which has entirely eliminated contributions to the "Computer Chronicles" television show, the Boston Computer Museum and the Charles Babbage Institute, the other four NCC cosponsors are making only scattered, marginal reductions in outlays for activities.

The IEEE-CS has cut back its roughly \$13 million budget by about \$500,000, due to lower-than-expected NCC revenue and other declines in revenue, said Executive Director T. Michael Elliott.

He said the IEEE-CS does not have a firm figure yet for its proceeds from NCC. "The AFIPS people are trying to close the books on it now,"

Elliott explained.

The downturn in the computer industry is also reflected in reduced participation in society events and less advertising and subscription growth for its publications, he added.

The IEEE-CS is cutting back on some of its tutorial programs, reducing the number of pages in the six magazines it publishes and doing "a general belt-tightening throughout the organization," Elliott claimed.

The ACM, whose current annual budget is about \$16.5 million, estimates it will take in about \$350,000 from NCC and other contributions from AFIPS, rather than the projected \$850,000, according to President Paul Abraham.

including other shortfalls in revenue from the computer industry slowdown, ACM's revenue may be off by about \$1.5 million, Abraham said.

The ACM is making scattered cuts in its budget, forcing some committee to become self-supporting, he said. The group hopes to narrow the gap by raising annual dues from \$50 to \$65.

Abraham noted that ACM's special interest groups, which operate under a separate budget, are doing better than usual.

The DPMA has reduced the number of pages in publications and cut down on fanfare at gatherings, but its lagging NCC revenue is "not a significant number in terms of our operating budget," said Executive Director John Venator. "Our members will see very little difference," he claimed.

The SCS took in \$280,000 less than projected from NCC in the year beginning July 1, approximately a third of the budget, Executive Director Charles Pratt said.

An editor and a graphic designer who left SCS have not been replaced, and the group has raised membership dues, prices of publications and fees for other conferences, he said.

North Carolina hackers draw indictments for fraud

By James A. Martin

CHARLOTTE, N.C. — Five North Carolina men have been indicted on computer fraud charges, including unauthorized possession of long-distance telephone access codes, as a result of a U.S. Secret Service investigation into an underground network of hackers who allegedly exchanged illegal information over Atari Corp. microcomputers.

The network of hackers has "tentacles reaching all across the country to the West Coast," said William Williamson, the agent in charge of the Secret Service office in Charlotte.

The continuing investigation began in January when a Raleigh, N.C., long-distance telephone company, Telamarketing Communications (TMC), reported it had lost an estimated \$100,000 to unauthorized calls within six months. Unauthorized long-distance calls lasting up to three hours were made at the telephone company's expense, Williamson said. Approximately 21 long-distance car-

riers such as TMC lost revenues as a result of the hackers.

The five men, ages 23 to 40, live in separate North Carolina cities, and all allegedly used Atari microcomputers and ITT Courier modems to access electronic bulletin boards. The bulletin boards provided the exchange of a variety of illegal information, Williamson said, including unauthorized long-distance and credit card codes and instructions on how to construct explosive devices.

Three of the men were indicted by a federal grand jury in Greensboro, N.C., the other two by a grand jury in Raleigh. The charges include devising a method for defrauding TMC and copyright infringements concerning Atari computer games.

An arraignment is scheduled Tuesday in Greensboro federal court for Robert E. Lee II, Tyrone Bullins and Michael McCann. Ralph Sammie Fig and James McPhail are scheduled to answer charges Oct. 6 in Wilmington, N.C., federal court.

In this issue

NEWS

Lotus's Symphony Release 1.2 converts Dbase III files, offers linear regression/ 4

Micro-Tempus gets jump on IBM with comprehensive micro-to-mainframe link/ 6

Aldus courts corporate mart with Page Maker desktop publishing program/ 6

IBM PC-based publishing software ships from Software Publishing/ 7

Companies debate shielded vs. unshielded twisted-pair options for building wiring schemes/ 8



Page 16

USC grad convicted of grade-altering with university computer/ 8

Security Pacific Bank's automation project provides data to spot customer prospects, hone sales pitches/ 10

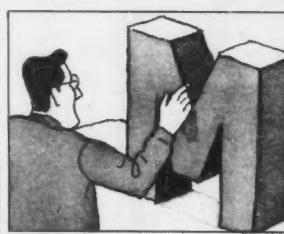
Orion to sign SNA software contract with Philips International/ 14

Cadetron develops full-function, solids modeling design system for PC AT/ 14

SOFTWARE & SERVICES

Sperry adds tool kit to Mapper application development system/ 19

McCormack & Dodge users seek product deliveries, not corporate reorganization/ 19



Page 43

COMMUNICATIONS

Bell Northern facilities test equipment ISDN conformance/ 23

DCA announces graphics, multisession features for IBM PCs/ 23

SYSTEMS & PERIPHERALS

HP mid-range mini provides performance boost over 3000 Series 42/ 29

The Yankee Group analyzes DEC's next five years/ 29

MICROCOMPUTERS

Wrong motherboard chip causes problems for Televideo PC AT clone/ 35

Easylan tool transfers data from 3½-in. disks/ 35

Sperry PC-line releases include laser printer/ 35

MANAGEMENT

Federated Investors converts order entry network to PC ATs/ 63

Companies of all kinds take second look at checkout scanner data/ 63

COMPUTER INDUSTRY

Texet survives with more business-oriented approach/ 89

Tandon reorganizes into two divisions, reduces work force again/ 114

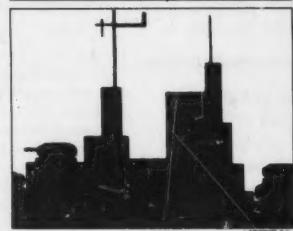
Burroughs to divest Sperry's Aerospace & Marine Group/ 114

Florida company acquires Columbia Data's assets, plans formation of users group/ 114

EXECUTIVE REPORT

Moving toward MAP: Smart managers will master this complex technology by implementing pilot programs now, rather than waiting for standardized Manufacturing Automation Protocol Version 3.0. By Mickey Williamson/ 43

IN DEPTH



Page 55

The case of the U.S. Navy: Building a PC-based expert system to aid budget analysts allocate funds turns Navy researchers into experts in their own right. By Michael Sullivan-Trainor/ 55

OPINION & ANALYSIS

Ahl on computer advertising/ 17

Sweet on data dictionaries/ 19

Minoli on TI multiplexers/ 23

Connolly on IBM's 3090 Model 400 deliveries/ 29

Zachmann on Plus Hardcard 20/ 35

Perot on success in business/ 63

Wilder on industry standards/ 114

DEPARTMENTS

Washington Update/ 13

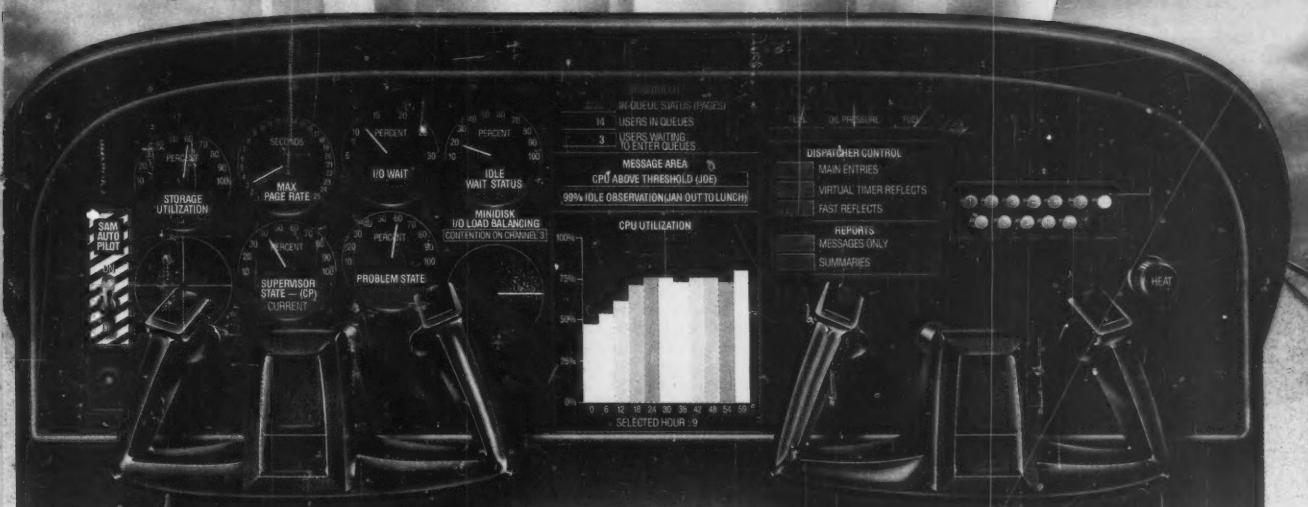
World Digest/ 15

Editorial/ 16

Calendar/ 67

New Products/ 73

VM MONITOR... "AUTOPilot" INSTRUMENTATION FOR YOUR VM SYSTEM



Some VM Data Centers today are "flying blind" when it comes to tuning and monitoring the performance of their VM systems.

And unfortunately, the result can be catastrophic... CPU is saturated, users clash for resources, and bottlenecks occur at peak times.

But now there's VMMONITOR.

VMMONITOR'S "AUTOPilot" FOR YOUR SYSTEM

VMMONITOR's unique System Automatic Monitor (SAM) warns your systems personnel of potential problems *before* approaching the critical stage. SAM will advise you of remedies, or even take corrective action on its own.

With SAM on autopilot, you'll experience smooth navigation through minidisk I/O load balancing, resource allocation for compute-bound users, and threshold monitoring.

ACCURATE MONITORING IN THE REAL-TIME WORLD

When your system has performance problems, new and faster hardware is

not always the answer. And performance analysts with the expertise to tune the system have become scarce.

Until now, your only other solution was specialized software that often ends up sitting on the shelf because it is too difficult to learn.

Both are very expensive propositions. But now there is VMMONITOR.

VMMONITOR accurately evaluates the current status of your system, reports on the essential CP variables, and recommends specific actions to improve VM performance.

VMMONITOR can save its cost many times over by dealing with inefficiencies instead of just throwing more hardware at the problem.

FULL INSTRUMENTATION VERSUS "IDIOT LIGHTS"

The hectic environment of a busy Data Center is no place for imprecise, and sometimes contradictory, information.

VMMONITOR gives you instant and easily-understood full-screen graphic representations, menus, and displays to identify problems before they become

disasters. VMMONITOR can be used with your color or monochrome terminals.

CLEAR MANAGEMENT REPORTING, TOO

VMMONITOR gives you graphic summaries, or detailed reports—all available on demand so you get the information you need when you need it.

A SPECIAL INTRODUCTORY OFFER THROUGH OCTOBER 31

VMMONITOR is regularly priced at \$9,000. But until October 31, you can get VMMONITOR for the introductory price of \$7,000. And if you are a VMCENTER customer, be sure to ask about the special discount for you.

To order VMMONITOR at the introductory price, and with a 30-day trial period, phone:

800-562-7100

703-264-8000 in
Virginia and outside
the continental U.S.



1-CWX-860901

VMMONITOR FROM VM SOFTWARE, INC....THE VM EXPERTS

Subsidiaries: VM Software (UK) Ltd., Reading, Berkshire, UK, Telex 85184992; VM Software GmbH, Frankfurt, W. Germany, Telex 841411204.

Symphony upgrade converts Dbase III files

Adds regression analysis, matrix manipulation

By Douglas Barney

CAMBRIDGE, Mass. — Lotus Development Corp. last week announced Symphony Release 1.2, a version of its integrated package that can convert files from Ashton-Tate's Dbase III data base software and that offers linear regression analysis.

The enhancements included in Symphony Release 1.2 are aimed at obtaining "spreadsheet parity" with Lotus 1-2-3 Release 2.01, according to Paula Berman, Symphony product marketing manager for Lotus. Like 1-

2-3, Symphony and its copy protection can now be installed on hard disks, and users do not need a "key disk" to load the product.

Although Symphony has the same spreadsheet functionality as 1-2-3, the two products are not completely compatible. "The two spreadsheets are not 100% compatible because they have different menu structures," Berman said.

In addition to regression analysis, Symphony now has matrix manipulation, a function used in statistical applications that allows multiplication and inversion across matrices of numbers.

Symphony also has controlled range input, which allows specific

spreadsheet cells to be designated to receive input.

Successful product

Despite industry criticism, Lotus considers Symphony to be a successful product but declined to provide sales figures.

Berman admitted, however, that it was not as successful as the firm expected. "When we initially shipped Symphony, we actually thought it was going to replace 1-2-3," she maintained.

Registered users of Symphony Release 1.0 or Release 1.01 can upgrade for \$75, and Symphony Release 1.1 users can upgrade free of charge, according to Lotus.

Multiuser arena braces for 386

From page 1

eral Corp.

In general, such multiuser systems will carry price tags in the \$9,000 to \$30,000 range. The systems will compete against Motorola, Inc. MC68000-based supermicros and departmental processors like IBM's System/36.

On a price-per-user basis, the prices of these machines should compare favorably with the early single-user systems, such as the Compaq Computer Corp. 80386-based personal computer, which is expected to range in price between \$7,500 and \$11,000, and Corvus Systems, Inc.'s \$12,795 Series 386 workstation.

Some observers, like William Welty, an analyst with Hambrecht & Quist in San Francisco, refer to the coming 80386-based multiuser systems as "VAX killers." The reasoning is that, faced with a \$60,000 per million instructions per second (MIPS) cost for a traditional superminicomputer like Digital Equipment Corp.'s VAX vs. \$5,000 per MIPS for a similarly configured 80386-based system with comparable throughput, many users will opt for the better price/performance deal.

Most of the 80386-based machines will run Unix and have the added advantage of running the huge base of existing Microsoft Corp. MS-DOS ap-

plications. This would give the systems an edge over not only VAX-class machines but also over multiuser supermicros based on Motorola's 32-bit 68020 processor, Welty says.

Welty expects the Intel chip to supplant Motorola's 68000 microprocessor family as the chip of choice in the 32-bit microprocessor market. While Dataquest, Inc.'s projections are not quite as dramatic, they still indicate a significant change is about to take place in the 32-bit microprocessor market. According to the San Jose, Calif., market research firm, Motorola controlled 60% of the 32-bit microprocessor shipments in 1985, with National Semiconductor Corp. holding a 33% share. But by the end of 1986, Intel will have shipped a 30% share of the chips, with Motorola slipping to 57% and National Semiconductor falling to 10%.

Some will not switch

Despite these predictions, several vendors of systems using the Motorola chips say they will not switch microprocessors. "We have absolutely no plans of going to the 80386," states John Glade, engineering vice-president at Alpha Microsystems, Inc. Redesigning the firm's systems for a new microprocessor would be too costly, and Motorola has so far ensured a nice migration path within its family, he says. Motorola recently raised the top speed of the 68020 from 20 MHz to 25 MHz and is known to be designing a compatible 68030 or 68040 chip, which may bring a mem-

ory management unit on-board.

Further, Motorola has been delivering the 68020 for the past 12 months, adds Don Morrison, product manager at Fortune Systems Corp. "Intel is playing catch-up," he says.

For multiuser business environments in the U.S., Intel's 80386 chip will have the biggest impact on small departmental systems serving 11 to 20 users, Dataquest analyst Elizabeth Levy says. In this category, 80386-based systems will go up against the likes of DEC's Microvax II, DG's MV4000 and IBM's System/36.

This category is precisely Altos's bread and butter, says Jeff Bork, product marketing manager. While Altos supplies OEMs with a 68020-based machine, its primary business is selling Intel-based systems to value-added resellers and dealers. Altos currently offers an 80286-based system that Bork says can host 30 users. Altos's 60-user, 80386-based machine, due out in the first half of 1987, will range in price to above \$40,000, Bork says.

The 68020 and 80386 differ in terms of technical specifications, but most observers say the only significant difference is the 80386's ability to run MS-DOS. Although Welty, Levy and many other observers stress the importance of the 80386 chip's ability to support MS-DOS along with other operating systems, the new Altos system will not be designed for MS-DOS, Bork says. In a multiuser environment, the demand for MS-DOS applications is not really very large, Bork claims.

Microsoft Chairman Bill Gates agrees that his company's personal computer operating system should remain on personal computers. "Having everybody on a shared processor can lead to unpredictable performance," Gates recently told *Computerworld* [CW, Aug. 18].

Given this conflict, Bork and others say diskless PC terminals will gain popularity by integrating MS-DOS on multiuser systems.

While new systems from Altos and other companies may compete against minis, large minicomputer vendors like DEC are not about to stand still. "Digital Equipment will be doing a lot at the low end as well as the high end of their product line," Levy says. "They have a lead in terms of market visibility, image and installed base over a lot of small companies that might be bringing out 386-based systems."

COMPUTERWORLD

Publisher
Donald Fagan

Editor in Chief
Terry Gatchpole
Executive Editor
Sharon Frederik

News Director
Peter Bartok
Senior Editors
James Connolly, Systems
Clinton Wilder, Industry
Elizabeth Horwitz, Communications
Charles H. Green, Software
David Ludlum, Management
Douglas Barney, Microcomputers

Senior Writers
Donna Raimondi
Rosemary Hamilton
Eddy Goldberg
Stanley Gibson
David Bright
Ninamary Baba Magrinis
New Products Editor
Suzanne Weixel

Intern
Susette Burton

Features Director
George Harris
Senior Editors
Janet Fenton
Glenn Rifkin
Barbara Wierzbicki
Associate Editor
Amy Sommerfeld Fiore
Assistant Editor
Deborah Fickling
Senior Writer
Michael L. Sullivan-Trainer

Managing Editor
Donald White
Chief Copy Editor
Charlotte Ziems Donaldson
Assistant Chief Copy Editor
Patricia Heil Erickson
Copy Editors
Julie Cook
Susan Miller
Kelly Stiles
Steven L. Ulfelder
David W. Bromley
Mary Grover

Design Editor
Marjorie Magowan
Graphics Editor
Mitch J. Hayes
Graphic Designer
P. Charles Ladouceur
Graphics Assistant
Jeff Babineau

Assistant to the Editor in Chief
Parth Domke

Editorial Assistants
Patricia Faherty
Christie Sears
Linda Gorgone
Bonnie MacNeil

Rights and Permissions Manager
Nancy Sharpen

News Bureaus
Mid-Atlantic
201/967-1350
Alan Alper, Correspondent

Washington, D.C.
202/247-6718

Mitch Betts, Correspondent
Southeast
404/394-0758
A. Martin, Correspondent

West Coast
415/528-8064
Jeffrey Beeler, Chief

Maura McElroy, Correspondent
Peggy Watt, Correspondent

CW Communications International News Service
Susan Blakene, Director

Main Editorial Office
Box 9171, 375 Cochituate Road,
Framingham, MA 01701-9171 617/879-0700

Computerworld is a member of the CW Communications Group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the CWG group contribute to the *Computerworld News Service*, a daily news service that is the leading daily domestic and international computer news service. Members of the group include: ARGENTINA'S *Computerworld/Argentina*; ASIA'S *Asian Computerworld*; AUSTRALIA'S *Computerworld Australia*; Australia PC World and Macworld; BRAZIL'S *DataNews* and PC Mundo; CANADA'S *Computerworld* and *Computerweek*; FRANCE'S *PC World et Run* (Commodore); FINLAND'S *Mikro*; FRANCE'S *Le Monde Informatique*, *Golden* (Apple), *OPC* (IBM), *Thémis et Distributrice*; GERMANY'S *Computerwoche*, *InfoWorld*, *PC Welt*, *Computer Business*, *PC Run*; ITALY'S *Computerweek*; JAPAN'S *Computerworld Japan*, *InfoWorld Japan*, *PC World*, *Computerworld Japan*; MEXICO'S *Computerworld/Mexico*; THE NETHERLANDS' *Computerworld Netherlands* and *PC World*; NORWAY'S *Computerworld Norge* and *PC Mikrodata*; SPAIN'S *Computerworld España*, *PC World* and *Commodore World*; SWEDEN'S *Computerweek*, *Macworld* and *Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; THE UNITED KINGDOM'S *Computer News*, *PC Business*, *PC World*, and *Computer Business*; VENEZUELA'S *Computerworld Venezuela*; the U.S. *America World*, *Computerworld/Cities*, *InfoWorld*, *MacWorld*, *Micro Marketworld*, *PC World*, *Run*; 73 countries, 80 Micro, Focus Publications and Network World.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

QUICK!

Name the fastest
VM dump restore,
and the fastest
VM sort program.

(SYBACK & SyncSort CMS.
What took you so long?)

Call (201) 930-9700.

Meet our super-
sonic systems.

If you didn't choose SYBACK and SyncSort CMS as the fastest in their categories, do not go directly to jail. But read this very, very carefully.

SYBACK, our fast dump restore for VM systems, and SyncSort CMS, the only high-technology sort for VM/CMS, represent a great technological leap forward. No other programs of their type can provide all three of the following positive advantages:

(1) THE FASTEST VM PERFORMANCE: SYBACK and SyncSort CMS make data move like greased lightning. Compared to their "competitors," these programs can save a tremendous amount of computer resources:

- 50% in Elapsed Time;
- 45% in VTime;
- 55% in TTime;
- 75% in SIOs.

These savings are the result of our exclusive Fluid Buffering Technique (FBT). First developed in OS and DOS sorting, we've now extended the benefits of FBT to VM backups and sorts.

(2) THE BEST VM PRODUCTIVITY: SYBACK and SyncSort CMS have tremendous operational flexibility and user friendliness. They're rich in features designed to reduce human intervention in backup and sorting:

• **SYBACK**—Automatic backup based on CP directory • Stand-alone restore capability • Incremental backup facility • Catalog of backup operations • Multi-tasking and execution under CMS • Interactive command processing • Standard-label tape support • Callable by user programs • DASD to DASD conversion and copying. Much, much more.

• **SyncSort CMS**—Sorts CMS, SAM (OS or DOS), or VSAM files • Can be invoked from COBOL, PL/I or BAL programs • Dynamically allocates disk space • Selects relevant records for sorting • Reformats records on output • Performs summaries of designated numeric fields • Produces reports with pagination, headings and dates • Can often produce simple reports in one day rather than, say, five. Much more, too.

(3) THE FINEST TECHNICAL SERVICE: Our Technical Service specialists are experts in their individual fields. You can count on fast, efficient, courteous service in both backup or sorting operations. More than 85% of all user requests for service are resolved within 24 hours.

CAVEAT EMPTOR: As with all performance software programs, the best way to find out what SYBACK and SyncSort CMS can do is to benchmark them yourself against your present programs.

That should help you make up your mind fast!



syncsort
INC.

Syncsort Incorporated 50 Tice Boulevard, CN18, Woodcliff Lake, N.J. 07675

NEWS

Aldus tunes publishing program for business use with discounts, support

IBM PC version seeks market beyond Apple

By Peggy Watt

SEATTLE — Aldus Corp. will court the corporate market with volume purchase and technical-support programs that will accompany release of the IBM Personal Computer version of its desktop publishing program Page Maker, to be announced this week.

Companies will also be able to obtain the discount price on joint purchases of both the version of Page Maker that runs on the IBM Personal Computer AT and compatible systems and the 1-year-old Page Maker version that runs on Apple Computer Inc.'s Macintosh.

Executives of Aldus last week declined to specify the discount structure. They said details will be announced when the PC version ships, before the end of this year. It is expected that volume discounts will be applicable to purchases of more than 100 copies.

Also scheduled for the fall are several optional training packages and the Page Maker Portfolio, a series of templates sold separately for less than \$100 that offer standard designs for common office forms, newsletters, memos and brochures.

The PC version of Page Maker will emulate the Macintosh's graphical interface by running only under the Microsoft Corp. Windows operating environment. For the first 90 days of shipment, the PC version of Page Maker will include a copy of Windows as a joint promotion with Microsoft, according to Aldus President Paul Brainerd. This version will also

offer a run-time version of Windows for users who do not want the graphical interface.

Also, the PC and \$495 Macintosh versions of Page Maker will be able to read each other's files directly, largely because 80% of the core code is the same for both versions, said Jeremy Jaech, engineering manager.

Typical configuration

The Page Maker for the PC costs \$695, for recommended use on an Intel Corp. 80286- or 8086-based system with at least 512K bytes of random-access memory, a 10M-byte or larger hard disk drive, IBM Enhanced Graphics Adapter or compatible card and a pointing device. The PC version is not copy-protected, though the Macintosh implementation is and will remain copy-protected in its next version, Brainerd said.

Features of the Page Maker PC version will also appear in updates of the Macintosh version, Brainerd said. Among them are such typesetting features as automatic hyphenation, kerning (variable spacing of characters) and drivers for a variety of scanner input systems. It can be used to create documents of up to 128 pages, up from 16 in the Macintosh version, and can display facing pages simultaneously.

Like the Macintosh version, the PC version includes a driver for printers running the page description language Postscript from Adobe Corp. It also supports the Document Description Language (DDL) from Imagen Corp.

Under Windows, Page Maker will be multitasking, but true multiuser capabilities through networking will not be available until later versions, Brainerd said.

but has now deferred that move until late 1987.

"We had had a capacity projection based on the last 24 months when we saw lots of growth because of a heavy migration to on-line transactions during that period. Plus, our new claims process reduced our backlog, which ended up reducing the overall processing," said Blue Cross's hardware and software analyst Gary Hudson.

"Summit" speculation

Hudson added that his company is re-examining the idea of moving to the Model 400 at all, particularly in light of analyst speculation that IBM will replace the 3090s with a system code-named "Summit" within a few years.

"We also got to analyze the 3084 and 3090 technology and didn't see anything that the 3090 offered us above and beyond the 3084. We decided to wait and see what IBM does and possibly skip the 3090 and see what they have with the Summit line," Hudson said.

He noted that his company found a 6% to 7% performance gain in a performance improvement feature added to the 3084 when the 3084 Model X units were introduced and is considering the addition of an older IBM 3081 as an extra processor.

One company that has delayed its Model 400 is Blue Cross/Blue Shield of Kansas in Topeka, which had planned to replace its IBM 3084 Model Q with a Model 400 in December

A user organization that is not im-

Broad data base access link unveiled by Micro-Tempus

By Elisabeth Horwitt

Stealing close to a year's march on IBM, Micro-Tempus, Inc. last week announced Tempus-Access, a comprehensive micro-to-mainframe product that it claimed is easier to use than IBM's Advanced Connection Facility (ACF).

Tempus-Access enables IBM Personal Computer users to select, sort and extract data from a wide range of IBM mainframe data base and system environments and download it into almost any popular microcomputer application, the company claimed. IBM's ACF, a micro-to-mainframe link announced in June, is scheduled for third-quarter 1987 release.

The Micro-Tempus product was designed to guide nontechnical micro users through "IBM's mainframe maze of different terminal monitors, operating environments and data base structures," President Yvon Leveille said. "It provides users with a common view across the different environments."

By filling in the blanks on a multiwindowed screen, users can specify the fields they want to access, the selection parameters and the sorting order for up to 60 fields. A record-sorting limit controls the amount of mainframe processing power taken up by any given job.

Requests are sent to DYL-270, a software product from Sterling Software, Inc.'s Dylocore division (formerly Informatics General Corp.). DYL-270 is a data base extractor that reads any sequential, ISAM, BDAM, VSAM file structure and also interfaces with proprietary data bases such as IBM's IMS and DL1, Cullinet Software, Inc.'s IDMS and IDMS/R, and Applied Data Research, Inc.'s Datacom/DB.

Security feature

DYL-270 extracts the requested data from mainframe files and loads it into a virtual disk that micro users can then access. "Containing users in one section of the mainframe provides the MIS manager with more control," Leveille said. The product's security feature can limit a user's access down to the field level, he added.

As data is loaded into the virtual disk it is converted to the comma-separated variable format, which is compatible with a wide variety of IBM PC software packages.

pacted by early deliveries of the Model 400 is the Salt River Project in Phoenix. The power project's assistant general manager, John Jacobs, said the organization eased its capacity pressures on its Model 200 by continuing a practice of off-loading applications to dedicated IBM 4381 processors. The Salt River Project still plans to acquire a Model 400 as originally scheduled in mid-1987, according to Jacobs.

Those users who said they were moving to the Model 400 reported that increasing demand in on-line and transaction processing is the primary reason.

"We've been using the 200 for on-line and development work. It's the only CPU we have installed, so it's really been doing everything. We ac-

cesses a company a year ago April — Western Casualty of Fort Scott, Kan. — so we have a lot more transactions to handle in our computer requirements," reported Karl Kasten, vice-president and DP manager of American States Insurance Co. in Indianapolis.

Owen of Shearson Lehman reported that his company's Model 200s have performed as well as promised and that most of the performance gains have been in batch environments.

However, he said he expects the Model 400s to absorb an increasing demand for on-line processing.

Staff members Rosemary Hamilton, Ninamary Buba Maginnis and Jeffry Beeler contributed to this report.

TOP OF THE NEWS

NEWS from page 1

for a dual-drive version, speculates George Colony, president of Forrester Research, Inc. in Cambridge, Mass., who dubbed it the ATjr. Colony said IBM will cease production of the PC XT in the first quarter of next year and sell off its inventory through 1987.

General Electric, which created a splash by negotiating microcomputer software site licensing agreements with Computer Associates, Inc. and Office Solutions, Inc., is expected to announce new agreements this week. Company officials declined to identify the firms involved.

In a Solomonic decision, Burroughs last week announced the merged company formed by itself and Sperry will be headquartered in both existing central sites of Detroit and Blue Bell, Pa. The company said it considered consolidating headquarters divisions in a third location, and a Sperry official said last week that Princeton, N.J., and Washington, D.C., had been considered, as had both Detroit and Blue Bell.

President Reagan is expected to renew the executive order banning sales of U.S. computers to South Africa's apartheid-enforcing agencies, White House and industry sources said. The order will expire Sept. 9, but Reagan is likely to extend the antiapartheid sanctions in hopes of forestalling congressional moves to enact a nearly complete trade embargo. A Senate bill includes the same computer ban as in the presidential order, but the House bill would force all U.S. firms to pull out of South Africa.

Sperry will announce Wednesday the Sperry PC Micro II, an 80286-based IBM Personal Computer-compatible microcomputer, running at 8 MHz with zero wait states and a small footprint. The machine will start at \$2,300 for a diskless version and fits five full-size expansion boards. Running Microsoft's Xenix, the machine can support up to five users.

Following recent layoffs at Intel and Advanced Micro Devices, Inc., analysts have their eyes on National Semiconductor Corp. Although National Semi's billings have increased of late, its orders have been on the downswing. "We may see more layoffs in the whole industry," says E. F. Hutton's Edward White. "The problem is not too little revenue. The problem is the cost of doing business. It is still way too high for the level of business they are seeing."

Sun Microsystems and Unisys Corp. last week announced that Unisys will sell Sun's Network File System (NFS) on its Unix-based operating system, Uniplus+. Sun's NFS distributed file system will be offered as the standard file system for Uniplus+. NFS provides users with the ability to transparently access files across a network of different systems from different vendors.

Publishing package debuts for IBM PC

By Douglas Barney

MOUNTAIN VIEW, Calif. — Software Publishing Corp. last week officially announced the Harvard Professional Publisher, a \$695 microcomputer desktop publishing package based on technology the firm acquired from Best Info, Inc. of Springfield, Pa.

The Software Publishing announcement underscores a trend to offer desktop publishing on the IBM Personal Computer and compatibles, rather than on the Apple Computer, Inc. Macintosh computer, which still dominates that market.

Software Publishing has high hopes for the package. "We expect our product to be one of the leading

high-end IBM PC-based desktop publishing products," said John Monson, senior product manager of Professional Publisher.

Aimed at experienced users

The company will market the product to users with prior publishing experience. For first-time users, the firm will offer Personal Publisher, a \$185 product with less functionality, Monson said.

One analyst who has seen the product said the firm has a good chance of succeeding in what is rapidly becoming a crowded market.

"There seems to be a crowding, at least on the horizon, but that is to be expected when you see a large in-

stallment of IBM PCs that have no desktop publishing software on them," said Ajit Kapoor, director of electronic publishing market analysis for Dataquest, Inc.

According to Kapoor, Software Publishing's solid dealer network will help the firm succeed. "They have the potential to be one of the leaders in this market," Kapoor said.

In addition, the market for desktop publishing software for IBM PCs and compatibles is growing rapidly. "In 1988, we see a crossover," Kapoor said. In that year, approximately \$800 million in IBM PC-based desktop publishing software will be sold vs. \$700 million for the Macintosh, Kapoor said.

Try ABR

Innovation's Automatic Backup & Recovery System

Free for 90 Days

Incremental Backup — Backup of changed data sets.

Archiving & Superscratch — ABR will automatically backup and scratch data sets off disk and keep track of the data sets in its own data base.

Automatic Recall — of Archived data sets under TSO or batch jobs.

Compression Option — Backup of Archived data sets in a COMPRESSED format.

DASD Management Report

- Backup and Archive report
- Wasted space report
- Generalized report writer...format your own report
- Extensive ICF VSAM reporting

Unlike device support, ISPF panels and much more...

1500 Users — Most widely used MVS disk management system

Performance — ABR is the fastest DASD management system. ABR will use less system resources than any other system.

COST — ABR is \$8,500 (perpetual license) for one CPU for existing FDR/COMPACTOR customers. Non FDR/COMPACTOR customers, total cost is \$16,500 (perpetual license).

Available for IBM VS1, MVS and MVS/XA systems.

For The Fastest DASD Management System... Fill in the coupon below or call INNOVATION at (201) 777-1940 for further information or a 90-day trial.

I am interested in ABR...
Innovation's DASD
Management System

Send Free 90-day Trial and
T-Shirt

Send FDR/ABR V5.0 User
Manual and ABR Poster

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____ Ext. _____

Mail coupon to: Innovation, 970 Clifton Ave., Clifton, NJ 07013-2793



INNOVATION
DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013-2793

NEWS

Cost, quality complicate shielded vs. unshielded wiring choice

MIS managers wrestle with cabling options

By Elisabeth Horwitt

The IBM Cabling System is complicating the lives of MIS managers shopping for a new building wiring plan to support their firms' voice and data communications needs.

Managers now face the dilemma of whether to save money by using Type 3 unshielded twisted-pair wiring that may already exist in their buildings or to install Type 2 shielded twisted-pair wiring, which costs more but has far greater data capacity. Some MIS managers, like nei-

ther of these options, are waiting for vendors like IBM to give them the best of both worlds: unshielded twisted-pair wiring that can support up to 16M bit/sec. data transmission.

IBM included Type 3 unshielded wire in its Cabling System specifications for users "who are not ready to invest in a special wiring system," says IBM network systems planning manager James Weston. "Since it's already in the wall, unshielded wire is an inexpensive way for a company to get started."

However, unshielded Type 3 wiring has found little favor with MIS managers because of its limited transmission capacity, according to the Los Altos, Calif., research firm International Technology Group (ITG). Out of some 30 IBM Cabling System users directly surveyed by ITG, no company was using the Type 3 unshielded wiring. "There are too many questions about its ability to handle traffic," says Claire Fleig, ITG's director of systems research.

In contrast, the shielded Type 2 wiring has so far found limited market, primarily among IBM shops that are wiring new buildings. "Type 2 is most cost-effective when you can put it into the wall during construction," Weston admits.

Mark Freund, marketing director of Interconnect Network Consulting Group of Pasadena, Calif., recently convinced United Way of the Bay Area to install the Type 2 shielded wiring as well as an IBM Token-Ring network in its new office. Freund concluded that the cost savings to be realized by using Type 3 wiring were insignificant when weighed against the risk of running out of data capacity at some future date. "Say you save \$1 per foot now by using unshielded instead of shielded twisted-pair wiring," he says. "That's nothing compared with the cost of replacing your wiring system five or 10 years down the road."

Freund contends that while unshielded twisted-pair wiring will work for an IBM Personal Computer Network at 1M to 2M bit/sec. or for a Token-Ring with a few workstations, at greater speeds and with more nodes, "you'll have delays caused by bad packets and a scenario where the accounting department waits 10 min-

utes for a purchase order to appear on-screen."

IBM's Weston agrees that unshielded twisted-pair transmissions are vulnerable to electrical interferences that are frequently generated in a building. However, he contends that high-quality unshielded wiring

and to find a way for unshielded twisted-pair wiring to support a 16M bit/sec. Token-Ring network. When that happens, they will install both the Token-Ring and the wiring."

Of course there are exceptions to this rule, especially among companies with modest data communica-

tions needs that are not expected to grow significantly in the foreseeable future. Such a company is Bank of Delaware in Wilmington. Last year, the bank started shopping for a wiring system for its new headquarters building. "We wanted the most cost-efficient and forward-thinking wiring that would allow our network to grow in size and sophistication without burdening ourselves with unnecessary technology," says Jo Petrea, assistant vice-president of administrative services.

Consultants at Network Strategies, Inc. recommended AT&T's Premise Distribution System (PDS), an unshielded twisted-pair wiring scheme very similar to IBM's Type 3 cabling. IBM had not yet announced specifications for Type 3 at the time. According to Vice-President of Data Processing James Massingale, "IBM Cabling System Type 2 would have cost us 40% more than PDS, primarily because of the wiring's price per linear foot, but also because of greater electronic connection costs." IBM Cabling System Type 2 reportedly costs approximately \$450 to \$750 per drop, depending on building size. AT&T figures were unavailable.

According to Network Strategies Group Manager Jeffrey Held, PDS can support the bank's new installation: five floors that will house, in addition to an IBM 4381 mainframe, 200 to 250 3270 Personal Computer terminals and some IBM PCs and a Wang Laboratories, Inc. Office Information Systems minicomputer. PDS can handle 2.7M bit/sec. IBM 3270 terminal-to-host links and 3M bit/sec. Wang terminal-to-host links over distances of up to 1,000 feet, Held claims. "PDS can even support the 4M bit/sec. IBM Token-Ring, as long as you limit the length and number of devices on the network," he adds.

"For what we plan to have, PDS is fine," Massingale says. "For 1,000 terminals all busily doing data entry, it wouldn't work."



These AJ 2400 bps modems can do it all.

The AJ 2400-T and AJ 2412-AD3H are the most versatile 2400 bps modems available.

The AJ 2400-T meets seven U.S. and international standards—Bell 303, 202S, and 212A; and CCITT V21, V22, V22bis, and V.23. This greatly simplifies modem purchase decisions—compatibility with existing modems is assured!

The AJ 2412-AD3H provides foolproof data security with 25-number callback capability, 25-number answerback, and two-level password protection for its nonvolatile memory dialer.

Both models are loaded with other advanced features such as extended Hayes "AT" command sets, automatic logon, and software programmable options to make your data communications more reliable and efficient.

Send the coupon for details.



Please send FREE information on the following:

- AJ 2400-T
- AJ 2412-AD3H
- Both

Name _____

Title _____

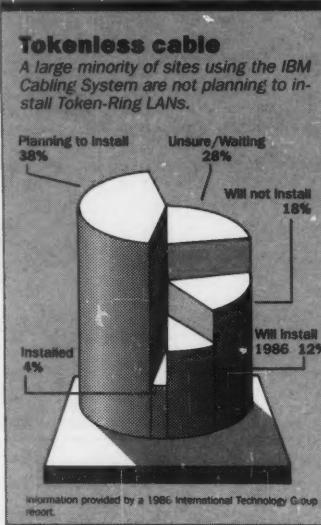
Company _____

Address _____

City/State/Zip _____

Phone (____) _____

Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 435-8520.



will support a Token-Ring of up to 72 workstations (compared with a 260-workstation maximum for Type 2 cable) and speeds of up to 4M bit/sec. Shielded twisted-pair can support 16M bit/sec., a rate unshielded can support only over very short distances.

Type 2 has been installed in some 450 new buildings, ITG says. But its image as "the Mercedes among twisted-pair wiring schemes," as one cabling distributor spokesman puts it, apparently has put off some companies that are thinking of retrofitting existing sites with new wiring.

But neither are companies installing networks on their existing cable, even if it meets IBM's Type 3 specifications, says ITG Managing Director Brian Jeffery. "My impression is that companies are playing a waiting game. They expect IBM to connect more of its systems to the Token-Ring

prosecuted the cases but could not be reached for comment.

Amini was the middleman in the alleged scam, Plafker said. Darryl Gillard, 27, a former USC employee who worked in the registration and records office and whose employment was terminated in May 1983, physically changed the grades.

Gillard, who testified against Amini, pleaded guilty to charges of illegal computer access and selling cocaine and will be sentenced to less than two years in prison.

Also involved in the case is another former student at USC, Manuel Roberts, 23, who reportedly paid Gillard to change his grades. He faces one count of illegal computer access.

Court convicts student in grade-fixing scam

By Susette Burton

A former University of Southern California (USC) student has been convicted of using a university computer to change his own grades and could face up to four years and four months in state prison.

Mehrdad Amini, 23, a native of Iran, has been in custody since February on \$100,000 bail and is scheduled for sentencing this week, according to Deputy District Attorney Stephen Plafker of Los Angeles. Plafker also said that this is the first case in which students were prosecuted for changing grades. He said he will recommend a higher sentence than he would normally suggest on a crime of this kind because Amini has

undermined the credibility of a major American university. The incident has been called the worst cheating scandal in USC history.

Although a Los Angeles Superior Court jury earlier this month found Amini guilty of changing his own grades, it was unable to reach a decision on whether he also changed other students' grades for money, despite the testimony of two former students who said they paid Amini between \$1,500 and \$3,000 to have their grades changed.

Seventeen students were reportedly expelled from USC after an investigation that began in mid-1984.

Robert Morley, USC associate director of registration and records,

IF IBM AND DEC TIED FOR SECOND, WHOSE DBMS WAS FIRST? ORACLE.

Today, computer users polled in the *Software User Survey* rank Oracle Corporation as their number one vendor choice for 1986. ORACLE® is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. In fact, *INC. MAGAZINE* ranks Oracle as the fastest-growing major software company in the USA.

Surprised? Don't be. Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979.

COMPATIBILITY

The ORACLE® relational database management system is compatible with IBM's SQL/DS and DB2. SQL/DS and DB2 represent IBM's latest generation of database management technology for IBM's largest computers. ORACLE's capabilities and user interface—the SQL language—are identical to those of SQL/DS and DB2. Programs written for SQL/DS and DB2 will run unmodified on ORACLE.

U.S. SEMINARS

AK Anchorage	Sep 9	Jacksonville	Aug 5	Grand Rapids	Oct 16	Cincinnati	Aug 5, Oct 21	
AL Huntsville	Dec 9	Orlando	Sep 17, Nov 18	Minneapolis	Jul 22, Sep 9,	Cleveland	Jul 22,	
Mobile	Sep 10	Tampa	Aug 6	MO Kansas City	Nov 4, Dec 18	Sep 23, Oct 28, Nov 13	Aug 12,	
AR Little Rock	Sep 30	Atlanta	Sep 23, Nov 6	St. Louis	Nov 12	Columbus	Sep 24, Oct 29, Nov 19	
AZ Phoenix	Aug 5, Oct 16, Dec 2	Columbus	Sep 8	MS Jackson	Sep 11	Dayton	Sep 9, Nov 5	
CA Los Angeles	Aug 6, Sep 11, Oct 14, Nov 13, Dec 16	Des Moines	Sep 27,	NC Charlotte	Nov 6	Oklahoma City	Sep 3, Dec 3	
Newport Beach	Sep 25, Nov 11	Boise	Sep 29, Nov 11	RAleigh	Oct 8	Portland	Aug 26, Nov 19	
Sacramento	Sep 22, Sep 18, Oct 30	Chicago	Sep 31, Sep 11	NE Omaha	Sep 24	PA Allentown	Sep 11	
San Diego	Sep 7, Oct 7, Nov 6	Indianapolis	Sep 9, Nov 5, Dec 18	NJ Cherry Hill	Sep 20	Harrisburg	Nov 6	
San Francisco	Aug 5, Sep 9, Oct 14, Nov 6, Dec 9	Wichita	Sep 19,	Convent Station	Aug 7, Aug 28	King of Prussia	Jul 24	
San Jose	Sep 7, Aug 23, Oct 21, Nov 13	Louisville	Sep 19, Oct 15, Nov 12, Dec 10	Iselin	Sep 22, Sep 16, Oct 9,	Philadelphia	Sep 9	
CO Denver	Sep 18, Oct 21, Dec 10	New Orleans	Sep 25, Dec 9	Princeton	Sep 25	Pittsburgh	Aug 7,	
CT Hartford	Sep 10, Oct 22, Nov 13	Boston	Sep 16,	NM Albuquerque	Sep 16, Dec 10	Oct 16, Dec 9	Oct 16, Dec 9	
New Haven	Sep 20, Oct 8, Dec 4	Burlington	Sep 12	NY Albany	Sep 11, Nov 20	Scranton	Aug 5	
FL Ft. Lauderdale	Sep 19	Springfield	Sep 18	New York City	Jul 24, Aug 12,	Charleston	Oct 7	
MD Bethesda	Sep 23, Aug 7, Sep 4, Oct 1, Oct 16, Oct 29,	Bethesda	Sep 18	Aug 26, Sep 3, Sep 17, Oct 2,	Sep 18, Nov 6, Nov 25, Dec 9	Memphis	Sep 18	
				Oci 22, Nov 6, Nov 18, Dec 10	Rochester	Oct 9	Amarillo	Sep 18, Nov 6
				Sep 15, Nov 18, Dec 10	Syracuse	Oct 14, Nov 18, Dec 11	Austin	Sep 18, Nov 6
				Sep 19,	Oct 21, Dec 16	El Paso	Oct 14, Nov 18, Dec 11	
				Sep 14, Nov 18	Jul 23	Fort Worth	Sep 23, Nov 13	

PERCENT
CONSIDERING
DBMS
VENDOR
FOR
1986

1986 RANK

1 Oracle	14.6%
2 DEC	12.2%
3 IBM	12.2%
4 Software Vendor	7.3%
5 Hardware Vendor	7.3%

SOURCE: 1986 Software User Survey*

PORABILITY

SQL/DS and DB2 run only on IBM mainframes; ORACLE runs on IBM mainframes, DEC, DG, AT&T, HP,

Stratus, Sperry, Prime, Honeywell and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. ORACLE runs under MVS, VM/CMS, VMS, PC-DOS, AOS/VS, UNIX™ etc. All versions of ORACLE are identical and include a complete implementation of SQL—not a subset.

CONNECTABILITY

Having the same software running on your mainframe, minis, and micros greatly simplifies the task of connecting your machines into a network. ORACLE's network software allows micro-computer users to directly access data stored in the shared database on the mainframe or minicomputer, or copy that data into the database on their micros and operate independently.

To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corporation, Dept. SW2, 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS.

CANADIAN SEMINARS

Calgary	Sep 25
Halifax	Oct 15
Montreal	Oct 20, Sep 17,
TN Memphis	Oct 15, Nov 24, Dec 17
TX Amarillo	Oct 9
Austin	Sep 18, Nov 6
Dallas	Sep 18, Nov 6
El Paso	Sep 18, Nov 6
Fort Worth	Sep 23, Nov 13

Call (800) 345-DBMS today.

©1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM, DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks.

*Published by SOFTWARE NEWS, minicomputer section. Copyright © 1986 by Sentry Publishing.

TRBA.

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Ottawa (613) 238-2381 □ Quebec (514) 337-0755 □ Toronto (416) 362-3275

ORACLE-U.K. (SURREY) 44-1-948-6976 □ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

Bank positions sales management with micro-based LANs

System speeds data access, links offices

By Jeffry Beeler

Security Pacific National Bank recently completed a \$6 million automation project aimed at sharpening the financial institution's ability to spot sales opportunities in the lucrative and competitive wholesale banking arena.

In a strategic application of information technology, the U.S.'s eighth largest bank has placed microcomputer-based local-area networks (LAN) in each of the roughly 40 Business Banking Centers (BBC) it operates throughout California.

Developed by Security Pacific Automation Co. (SPAC), the bank's data processing services subsidiary, the LANs greatly speed access to the information that the parent organization's Business Banking Division (BBD) uses to pick its prospects and tailor its individual sales pitches.

"Our system is definitely on the leading edge of technology," said John Griffith, a Security Pacific senior vice-president and head of the BBC. "After having talked to outside vendors, we've concluded that there's probably no other system like ours anywhere in the marketplace."

Launched approximately three years ago, SPAC's automation project allows the BBC to draft and revise its

loan documents electronically.

With the help of assorted integrated software packages, the LANs have also automated the division's credit analysis process.

"Our new technology has doubled the speed with which we can do financial projections and thus has given our account officers more time to spend in the field, servicing existing clients and developing new business," Griffith said.

But by far the technology's most important function is as a sales management system for the BBCs, which serve so-called "middle-market" accounts — companies with annual revenue ranging from \$5 million to \$100 million.

Using its own local Novell, Inc. networking system, each center, for the first time, is now able to keep track electronically of which banking products and services its sells to a given client.

The Novell LANs also collect historical information that gives an indication of what kinds of loans or cash management services are typically used by businesses in a specific

industry group.

Access to such information aids BBC account officers greatly in uncovering potential customers. "When we approach a prospect, we'll know, based on our historical data, exactly what types of services that particular business should have," said John Cronin, the BBC's vice-president for planning and marketing. "We will then be able to discuss those products with the prospects."

The same LAN-supplied information will also enable account officers to pinpoint sales opportunities among the BBD's existing customers by revealing gaps in the clients' current portfolio of banking services, Cronin said.

"Without the new technology, our ability to respond promptly to customer needs almost certainly would have lagged," Griffith said. "Other banks would have beaten us to the punch and passed us by in the middle market."

In the past, the BBCs recorded the results of their sales and prospecting efforts on tickler cards. But under the previous system, retrieval of

needed information took "massive amounts of time," according to Griffith.

"To find out what was happening in a certain office, we would have to contact the location, which would then consult the tickler cards and report to us manually."

With the automated system, customer and prospect information is downloaded from public data bases and from an Amdahl Corp. 470V/8 at the bank's data center in Brea, Calif., near Los Angeles. The information goes first through T1 lines to a Novell LAN in Security Pacific's application development center in neighboring Glendale, Calif.

After being massaged and reformatted, the information is then routed over phone lines to the appropriate BBC, where it is stored in Novell S/Net LANs, according to John Lafare, vice-president of SPAC's Distributed Banking System.

Attached in a star topology to each remote S/Net is a network of floppy-disk-based IBM Personal Computers, which are used to run local data base inquiries and extracts.

Periodically, the BBCs also upload selected sales and prospect information to Security Pacific's host mainframe, where the material is centralized and used to generate management reports, Lafare said. From the reports, Griffith and his superiors can then assess each BBC's financial performance.

'Without the new technology, our ability to respond promptly to customer needs almost certainly would have lagged.'

John Griffith
Security Pacific National Bank



There are more than 5,000 installations of the PowerHouse® development language around the world

is for all around you

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668



is for bridging databases

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

WHAT'S REALLY GOING TO HAPPEN WITH EXPERT SYSTEMS?

EXCITEMENT OVER AN IDEA.

There is great excitement over expert systems. Great excitement over how they can help major corporations and government achieve their strategic goals.

But with the excitement over expert systems comes confusion.

Until recently, prevailing wisdom has been that expert systems demand specialized hardware, a software environment requiring unconventional languages, and a new type of developer using totally different system development and project management approaches. No wonder knowledge engineering hasn't been swept into broad acceptance by the mainstream computing establishment — it *appeared* there was no way to leverage existing assets. Until now.

Until now, no one has been able to convincingly answer the *one question*: What's really going to happen with expert systems? Teknowledge's commitment and success in the commercial market has enabled us to answer that question.

1

The bulk of all expert systems will be built by today's software engineers and programmers, using expert systems development software written in conventional computing languages, and using an evolution of existing project management methodology.

2

Most expert systems will be implemented on existing conventional hardware and meet conventional software performance standards.

3

Most expert systems will be tightly integrated with existing DBMS, accounting systems and other applications software.

4

Most expert systems will leverage existing software applications and will more effectively solve problems already being solved today.

WHY BELIEVE THE TEKNOWLEDGE ANSWER?

Discovering the answer didn't come easily.

Nearly 200 different companies use Teknowledge's software development products to build their own expert systems. In its custom work, Teknowledge leads the field in applications developed and real problems solved — for its strategic investors, such as General Motors and Procter & Gamble, and many other major corporations.

Teknowledge was granted the first expert systems software patent ever. Teknowledge was awarded the largest

Department of Defense research contract ever granted to a commercial company for expert systems development software — to create ABE™, a next-generation of high-performance, knowledge engineering development software.

YOU CAN QUICK START FOR \$7500. CALL TEKNOWLEDGE TODAY.

Where do you go from here? How do you get up to speed fast, and reap the greatest initial payoff with

the least possible cost?

Teknowledge's Quick Start™ package is the right place to begin building an expert systems capability. It may come as a surprise, but some of the largest potential gains from expert systems can come quickly from simple applications, as well as from the very large advanced projects normally associated with this technology.

So, to keep your entry cost to a minimum, Teknowledge is offering the Quick Start package for \$7500. This includes M.1, our PC-based expert systems development software written in C, a multiple delivery system license, one week of knowledge engineering methodology training, and one week of specific M.1 training. In addition, Quick Start licensees will receive a reduced price on future licenses to deliver M.1 expert systems on IBM mainframes.

Quick Start is the entry point, from which you can succeed in expert systems on any scale.

So, for your Quick Start, or to find out when a Teknowledge seminar will be in your area, call 415/424-9955 now. Or write today.

TEKNOWLEDGE

Applied Artificial Intelligence

1850 Embarcadero Rd., Palo Alto, CA 94303

Copyright ©1986 by Teknowledge. Quick Start and ABE are trademarks of and Teknowledge is a registered trademark of Teknowledge, Inc. IBM is a registered trademark of International Business Machines, Inc.

TRBA Adv.

NEWS

Cobol-based AI shell bows

From page 1

led the effort to produce M&D's Millenium accounting series.

According to Landry, the inference engine of the shell can be called by a Cobol application to act on the rules in a knowledge base created by the user. The shell, written in Cobol, provides both forward- and backward-chaining reasoning methods, Landry said.

Most expert systems and expert system shells have been written in LISP or Prolog, requiring dedicated hardware; a few are available in the more portable C language. Only a handful, however, have been designed to run on IBM mainframes, and observers of the artificial intelligence field say the DMS product is one of the first designed to operate with mainframe applications.

"Up until a year ago, expert systems had a tendency to be islands of technology," noted Tom Schwartz, president of Tom Schwartz Associates, a Mountain View, Calif., consulting firm. "You had to pick an application that didn't need to talk to anything else. Since a majority of business applications are data base driven, this will allow expert system technology to be integrated with data base technology."

Landry's history with M&D was also seen as a positive factor for the DMS product. "He's the first guy in

the inference engine business who has a lot of credibility in mainstream system software," said Curt Monash of the Paine Webber, Inc. brokerage house in New York.

Top-level MIS executives in financial services companies expressed keen interest in the DMS approach. "I'm beginning to believe something like this is the only way of bringing expert systems to a banking environment," said George DiNardo, executive vice-president of the information management and research department at Mellon Bank N.A. in Pittsburgh.

However, DiNardo predicted mainstream commercial acceptance of AI techniques will be slow. "It takes time for it to leak into the culture of a systems development organization," he said.

Meeting need for linkage

David J. Blackwell, executive vice-president at Massachusetts Mutual Life Insurance Co., said that the claims for Impact/AE would seem to meet the need of linking expert systems to existing Cobol systems and data bases.

Blackwell said he has not been looking at IBM hardware as an expert system vehicle. Instead, Blackwell has been using a symbolic processing system on-line, but he said it is not used very interactively.

"Anything that can make us not have to use an AI LISP machine-type environment is welcome, so we can do it right on the mainframe," said Roger Schelm, vice-president, applied research/expert systems at

Cigna Systems, a division of Insurance Company of North America, a Cigna Corp. company.

"We need the AI/expert systems world integrated with the traditional processing area, where there already is a large investment in data bases and applications," Schelm added. "I'd like to use that expertise to look at vast quantities of data that flow through a system. That calls for embedding the expertise into the application."

DiNardo said AI and expert systems could be applied in a number of ways in the banking industry. In the credit area, expert system technology could be used to train new personnel, to incorporate the expertise of a bank's loan committee for evaluating large loans and to aid a bank examiner in evaluating a loan portfolio.

In the trust area, expert systems could be used for selecting investment portfolios. And in currency arbitrage, which involves swapping numerous currencies, DiNardo said a good trader can deal well with two or three currency swaps, but a good expert system could better deal with a greater number.

Impact/AE uses IF-THEN-ELSE logic to compare conditions found by the application to the rules in the knowledge base. A user may build the rules using simple, English-style statements, Landry said.

In addition to being able to be called by a mainframe application, the expert system developed from the Impact/AE shell may also access mainframe files, including VSAM, IBM's SQL and RMS, company

spokesmen said.

The shell will first be available to run on the Digital Equipment Corp. VAX line in October, since it has been developed at DMS on VAX minicomputers; it has not been released to any beta-test sites.

The version to run in IBM's MVS/CICS environment will be available in January, with an IBM Personal Computer version available in the first quarter of 1987. Impact/AE will be priced from \$55,000 to \$125,000.

Landry said he did not use LISP or Prolog for his firm's shell because they are both "highly inefficient" and cannot be blended into the IBM mainframe environment.

"Language is not crucial to the user. The language best suited for an expert system is the one that allows the user to write a program that calls the inference engine," he said.

The expert system shell includes a text editor and compiler to support text editing, optimization and debugging within the development environment.

End users may access the expert programs through a menu structure. Based on information provided by the user, the system will issue prompts for more information with automatic queries. The user may ask the system how it reached a conclusion, and the system will review step by step the rules it referred to, Landry said.

Impact/AE also provides a percentage estimate of accuracy on the conclusions it returns, he said.

Senior writer Eddy Goldberg contributed to this report.



*The
PowerHouse®
language is
used by 115
Fortune '500'
companies and
is taught in
more than
100 colleges
and universities*



*You can
call on any
of our 36
offices in
eight
countries for
PowerHouse®
software,
service,
and support*

**is for
companies
and
colleges**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

**is for
office
doors**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

NEWS

WASHINGTON UPDATE
Mitch Betts**Bill introduced to reform computerized cross-checks**

U.S. Sen. William S. Cohen (R-Maine), concerned that uncontrolled use of computer matching threatens individual privacy rights, recently introduced a bill to better protect Americans whose computerized records are cross-checked by government agencies.

Computer matching to detect waste and fraud in government programs tripled between 1980 and 1984, Cohen noted, and yet research shows that the matches occasionally violate the spirit of the Privacy Act of 1984 [CW, July 7]. "My legislation attempts to strike the proper balance between the legitimate needs of government efficiency and personal privacy," Cohen said.

The bill would establish a Data Integrity Board at each agency to approve and oversee matching programs and require federal agencies to spell out in a written agreement their plans for using data gathered from a computer-matching program.

The bill would also require agencies to verify the accuracy of records used in computer matches, notify the individuals involved and provide them with an opportunity to refute the information.

THE CAMBEX 3090 ALTERNATIVE

Preserving corporate resources - it just makes good business sense. That is why many mainframe users are retaining the 308X system and upgrading main memory instead of changing to a 3090.

A few good reasons to upgrade with Cambex memory:

PRICE. RELIABILITY. DELIVERY.

Making your 308X perform at its top capacity is now easier than ever before. Our STOR/8000 Universal add-in memory gives you 8, 16 and 32MB increments at prices a full 40% lower than IBM's, yet with much higher reliability figures. Cambex boards add in just like IBM boards, with no extra space, cabinets or cooling. But unlike IBM add-in memory, the STOR/8000 is transplantable among all 308X models.

As the only independent manufacturer of add-in memory for the 308X series, for 16 years Cambex (formerly Cambridge Memories) has added memory to every model of large-scale IBM computers.

Cambex Corporation
360 Second Avenue
Waltham, MA 02154

(US) 800-325-5565
(MA) 617-890-6000
(TLX) 92-3336

Cambex - A GOOD PLACE TO PUT YOUR INFORMATION

Group would study effect of computers on society

The U.S. Senate Committee on Governmental Affairs recently approved a bill to establish an Information Age Commission.

If enacted by the Senate and the House of Representatives, the bill would create a two-year study commission to report to the government the effects of computer and communications technology on society, personal privacy, business and government.

The bill is sponsored by Sens. Sam Nunn (D-Ga.) and Frank R. Lautenberg (D-N.J.) and endorsed by ADAPSO, a computer software and services industry association.

"The commission can provide a focal point for data collection and discussion of the issues that will provide a window on the future to help our nation take full advantage of computer technology," said Luanne James, interim executive director of ADAPSO.

Federal agencies required to seek potential bidders

Recent administrative rulings that implement the 1984 Competition in Contracting Act (CICA) will force federal agencies to take more aggressive steps to ensure that all possible vendors are encouraged to compete for government data processing contracts.

In two precedent-setting cases, the General Accounting Office and the General Services Administration's Board of Contract Appeals overturned procurements when incumbent contractors protested that they were not notified of new procurements.

Before CICA was passed, the responsibility for finding out about new bid proposals rested mostly with the vendors.

But according to a recent bulletin by analysts at research firm International Data Corp.'s Washington, D.C., division, that responsibility has shifted to the agency.

Consequently, agencies must conduct market surveys to identify potential bidders and foster full and open competition through procedures that permit all capable vendors to submit bids, the research firm reported.

Industry lauds Korean vow to thwart software piracy

The U.S. computer and software industries praised a recent agreement between the U.S. government and the Republic of South Korea under which the Korean government promised to combat the piracy of U.S. software.

The agreement settles an investigation under Section 301 of the 1974 Trade Act that the Reagan administration launched last year. The U.S. charged that South Korea did not adequately protect U.S. copyrighted

works from pirates who copied and resold them without compensation to the originator.

The Computer and Business Equipment Manufacturers Association and ADAPSO, a software and services trade group, praised the negotiated settlement.

The accord stipulates that U.S. software will be protected under a Korean copyright law that will take effect July 1, 1987. In the meantime, the Koreans said they would enforce existing laws in order to halt software piracy.

Commerce to translate Japanese technical info

President Reagan recently signed into law a bill to help U.S. companies stay abreast of Japanese technological innovations.

The bill earmarks \$1 million for the Department of Commerce to acquire and translate selected Japanese technical documents.

"U.S. efforts to gather, translate and distribute Japanese technical literature are not coordinated and cover only about 20% of the available material," maintained Sen. Max Baucus (D-Mont.), one of the bill's sponsors.

Reagan said the legislation recognizes that the U.S. lead in high-technology industries — such as computers, semiconductors, fiber optics and robotics — is challenged by Japan, which has an active program to use foreign technical information.

LaserMaker
*Desktop Publishing Software
for IBM and Compatible PC's*

Desktop Publishing becomes a reality.
with YOU in complete control.

Introducing LaserMaker™ — THE composition package for the IBM PC, providing full typographical features at an unheard of price! With instant on-line hyphenation and justification — line endings always correct as you type! Fast soft-copy proofing on the same screen and output to the LaserWriter!

LaserMaker brings the highest quality composition to your desktop: spaceband control, automatic tracking and kerning, and hyphenation by logic and exception dictionary. Look at our features! Compare our price!

LaserMaker™ LaserWriter™ LaserWriter™
LaserWriter™ LaserWriter™ LaserWriter™

Now at a price you can afford

\$795!

ORDER TODAY FROM

LaserMaker Inc

P.O. Box 802140 Chicago Illinois 60680-2140
or see us at:
Seybold Desktop Publishing Conference,
Hyatt Regency, San Francisco,
Sept. 4-6, Booth 103.

LaserMaker Features

- preview at 25% to 200% of actual size
- fast (1000 c.p.s.) hyphenation and justification
- user-modifiable exception dictionary
- 32,000 character file size
- any pointsize from 4 to 200
- manual kerning and letterspacing
- automatic kerning, 570 pairs per font
- automatic tracking, 3 tracks per font
- user-modifiable kern pairs and tracks
- full control over spaceband sizes
- search and replace text or commands
- 35 tabs by either gutter or indent
- page layout (PageSet) facilities
- on-line help for all system functions
- spelling checker interactive with H & J
- display of all LaserWriter™ characters
- Pop up keyboards for auto insertion of pi or accented characters

LaserMaker hardware requirements

- IBM XT, AT or compatible
- 640K of memory
- EGA/Hercules graphics card

**PREVIEW
BEFORE YOU SET!**

with LaserMaker

P.O. BOX No. 802140 CHICAGO ILLINOIS 60680-2140

Composed using LaserMaker/PageSet and output to the Apple LaserWriter™
Ask us about driving your photosetter!

Software sales pact with Orion lets Philips products tie into SNA nets

Ten-year deal brings firm LU6.2 capabilities

By Eddy Goldberg

BERKELEY, Calif. — The Orion Group, Inc. is expected to announce tomorrow that it has signed an agreement with Philips International B.V. of the Netherlands to integrate two of Orion's communications software products into Philips' product line.

The multimillion dollar, 10-year pact is intended to allow Philips to link its products into networks supporting IBM's Systems Network Architecture (SNA).

The Orion Group will license its SNA62 Peer Communications Facility and Document Interchange Architecture (DIA) Source/Recipient Facility to the Dutch electronics giant, which will market them worldwide under its own label.

Offering peer-to-peer capabilities

Orion President Paul Rampel says that he expects the deal will place Philips among the first European electronics manufacturers to offer the peer-to-peer capabilities afforded by IBM's LU6.2.

Orion's SNA62 Peer Communications Facility supports both IBM's LU6.2 and PU2.1 enhancements to SNA, enabling peer-to-peer communica-

cation between a variety of office computing equipment.

The DIA Source/Recipient Facility allows users of the Peer Communications Facility to exchange Document Content Architecture formatted files with IBM's Distributed Office System.

Both packages are written in the C programming language.

Earlier LU versions to be combined

The agreement also reportedly calls for the joint development of a software package that implements LU0, LU1, LU2 and LU3, earlier versions of the SNA standard that support hierarchical network communication between a host and dumb terminals such as the 3270.

The combined package will be offered by Orion within nine months, filling out Orion's SNA product line, Rampel says.

He expects Orion to be the first company to offer LU6.2/PU2.1 capabilities integrated with the older LU architectures.

"It will allow a user to have coexistence with older applications based on LU0, 1, 2 and 3, and allow development under the new architecture with newly developed LU6.2-based applications," Rampel says. This should provide an easy migration path from old to new applications, according to Rampel.

Start-ups offer full-function solids modeling design systems

By James A. Martin

Solids modeling, like many other computer-aided design processes that were once exclusively run on large systems, is becoming a personal computer-based application.

At the Autofact computer-aided design and manufacturing show in Detroit this November, Cadetron, Inc., a fledgling Atlanta firm, is set to introduce its first product, the Engineer Works. Also at Autofact, Aries Technology, Inc. of Lowell, Mass., will unveil its Conceptstation.

Both systems are described as full-function solids modelers that run under Microsoft Corp.'s Xenix operating system on the IBM Personal Computer AT.

Earlier this year, Caetec Systems, Inc. of Atlanta released its solids modeling design system for the PC AT. Caetec's Professional Engineering Series, however, runs under IBM's PC-DOS operating system instead of Xenix, although it does run on the AT&T Unix-based Sun Microsystems, Inc. workstations.

"For a long time, PCs didn't have the computing power to run software as sophisticated as solids modeling," said Tom Couch, vice-president of marketing and product development for Caetec. "With the AT, micros are now approaching having the necessary power, and that's why we're

seeing the introduction of these very sophisticated software programs for micros."

Major redesign necessary

"Solids modelers were not designed for the desktop, so we had to redesign everything," said Richard Miller, vice-president of marketing for Aries. "We will have invested \$15 million to \$20 million to put this thing out."

Cadetron's basic Engineer Works system will retail for \$5,000, with all eight modules costing \$15,000 and a total system including all necessary hardware running around \$28,000, according to Jim Spencer, Cadetron president.

The Aries system, excluding the PC AT but including a high-resolution monitor, 60M-byte disk, 9M bytes of random-access memory (RAM) and a proprietary 32-bit array processor, costs \$39,000, according to Miller.

Caetec's Professional Engineering Series, which consists of solids modeling, finite element modeling and analysis and other applications, retails for \$19,000. The system runs on a PC AT, not included, with 640K bytes of RAM and no requirement for add-on boards, Couch said.

Senior writer Rosemary Hamilton contributed to this report.



*Everyone,
MIS and
end-users,
together build
commercial
systems faster
and easier
with the
PowerHouse®
development
language*

**is for
everyone**

COGNOS

In the U.S. call 1-800-4-COGNOS
In Canada call 1-613-738-1440
In the U.K. call +44 344 486668

PowerHouse is a registered trademark of Cognos

Sometimes the impossible is possible

Run your IMS/DC applications
under CICS with...

VISION/1

Challenge us!

STAR

Software Technologies
and Research, Inc.

160 West Street Cromwell, CT 06416-1930

In CT 203-529-7128 **1-800-258-STAR**



World Digest

Glass-based disks to roll

TOKYO — Hoya Corp., a Tokyo-based Japanese optics and electronics firm, recently announced a glass-substrate magnetic diskette, which it claims has a memory capacity five to 10 times that of existing aluminum-based products, for about the same unit price.

The Hoya diskette, to be available in 3½- and 5¼-in. versions, was developed jointly by Hoya and unnamed U.S. companies.

To create the product, Hoya applied a magnetic medium directly onto a glass substrate. Conventional diskettes require a layer in between the aluminum substrate and a recording medium.

According to a Hoya spokesman, the key to increased memory capacity is the smoothness of the glass substrate, which allows the aperture between the read/write head of the diskette drive and the diskette surface to decrease to submicron levels.

Mass production of these diskettes is scheduled to begin at a former Amplex Corp. plant in San Jose, Calif., this month.

Release of the dual version of the

Unlike most Japanese electronics manufacturers, Hoya, capitalized at \$34.6 million, plans to place the first lots for delivery on the U.S. market. "Reactions from U.S. computer vendors will provide us with a good litmus paper," the Hoya spokesman said.

ICL mum on Series 39 issue

LONDON — UK mainframe maker ICL PLC last week was tight-lipped over reports that it is about to launch a new version of its Series 39 Level 80 mainframe, although the firm reportedly has already supplied a system to a local authority near London.

The system is said to be halfway between the Level 30, which operates at 2.2 million instructions per second (MIPS) and the 11-MIPS Level 80. But ICL declined to comment on the rumors. "The move makes sense," said Philippe de Marcillac, research director of International Data Corp. Europa. "There is a big gap between the two systems."

When the Level 80 was launched in early 1985, ICL announced plans to bring forth dual versions of the system by the end of that year and a quad-processor system with 35 MIPS by the end of this year.

"We hope to beat the IBM 3090 Model 400 to the marketplace with our quadruple Level 80," the company declared at the launch. ICL hoped to use its Macrolan high-speed local-area network to create the multiprocessor systems.

Release of the dual version of the

system was pushed back until next year. So far, ICL has taken more than 200 orders for the Series 39 range.

Red tape snags Finn's 3090

HELSINKI, Finland — The Finnish State Computer Center must operate its IBM 3090 Model 180 mainframe without the vector processor initially ordered for use in scientific applications, due to government red tape. Currently under installation, the mainframe was to have been operational by the end of August and will be used by Finnish universities and other organizations for scientific purposes. U.S. authorities have not yet specified whether the IBM 3090/vector processor combination should be classified as a supercomputer. If it is, a special license will be required, permitting authorities to restrict the computer's uses.

Burroughs wins China deal

HONG KONG — The Hong Kong and Shanghai Banking Corp. has awarded its \$25 million worldwide banking terminal replacement order to Burroughs Corp., industry sources revealed last week. A letter of intent was sent out at the end of July, and the deal is set to be inked late this month or early in October, a bank source confirmed.

The deal covers the installation of up to 750 branch controllers, each running between 10 and 20 terminals. The value of the terminals alone

is estimated at \$7 million.

Sources close to the negotiations said the evaluation team had recommended NCR Corp., but a series of price reductions offered by Burroughs, coupled with the availability of new applications software, swung the decision in Burroughs' favor at the last minute.

IBM, which finished fourth in the ranking, is believed to have been scratched from the list weeks before the final decision because of its unwillingness to modify its systems to meet the stringent criteria of the bank, particularly in relation to signature verification on the proposed systems.

Fujitsu commits to AI mart

TOKYO — Bolstered by projections that Japan's artificial intelligence market will multiply in size 45 times by 1990, Fujitsu Ltd. is boosting its efforts to develop AI software products.

At the core of the Fujitsu commitment is the vendor's E-Shell/FM, a personal computer-based expert development package.

Fujitsu's E-Shell/FM, which runs on its 16-bit FM16 Beta PC, is priced at \$2,940. The Japanese-language E-Shell/FM, slated to ship early this month, is said to support both the production and frame-type of knowledge bases.

Compiled from the CW Communications International News Service.

CICS Users:

To increase uptime and control your file availability... Challenge DADS.

Greatly enhances CICS 1.7 allocation capability

- Allocates/deallocates user and transient data files
- Eliminates CICS downtime if files can't be allocated
- Supports all CICS startup options
- Requires no modifications to CICS
- Allocates/deallocates files by groups
- Automatically opens and closes files
- Automatically enables/disables transactions and programs
- Provides security exit and audit trail
- Automatic time-initiated allocation/deallocation
- Batch interface
- O/S core manager
- MVS systems only

DADS (Dynamic Allocation/Deallocation Subsystem) — Productivity Software from STAR

Challenge us!

STAR

Software Technologies
and Research, Inc.

160 West Street Cromwell, CT 06416-1930

In CT 203-529-7128 **1-800-258-STAR**

FAST FASTER FILESAFE

**The fastest and most versatile
VSAM Forward Recovery and
Journal Management product available!**

- Forward recovers VSAM files
- CICS version 1.5 - 1.7 and filesafe batch journals supported
- Journal copy, merge and analyze capability
- Extensive performance options
- Comprehensive reporting
- Built-in installation verification procedures
- No changes to MVS or CICS
- User exits
- Free evaluation period

FILESAFE: The software that significantly increases application availability and decreases recovery time!

Challenge us!

STAR

Software Technologies
and Research, Inc.

160 West Street Cromwell, CT 06416-1930

In CT 203-529-7128 **1-800-258-STAR**

VIEWPOINT

EDITORIAL

The race for a faster chip

The personal computer industry appears to be getting ahead of itself and, in so doing, risks leaving behind a crowd of confused corporate users.

Just as the current crop of IBM Personal Computer AT-class microcomputers has made significant inroads into the office, the next generation of machine — built around Intel Corp.'s much-hyped 80386 chip — made its appearance last week. The first of this new breed of PC AT-compatible systems came from Corvus Systems, Inc. It will be followed in short order by similar products from Compaq Computer Corp. and a raft of others.

In the face of all the hoopla over Intel's power-house chip and the grand new systems it will fuel, some users may be tempted to leap on the 80386 bandwagon, for fear of being left in the dust. Nothing could be farther from the truth. Thus, one savvy MIS director's response to the new machines: "Who needs a Corvette in a 15-mile-an-hour speed zone?"

Development trends over the past decade have reduced the size and increased the power that can be harnessed at the desktop by unimaginable leaps and bounds. Witness last week's announcement from the Hyundai Group, the \$10 billion South Korean conglomerate, that it intends to market a fully configured IBM Personal Computer XT-compatible computer and will sell it through discount stores for less than \$1,000.

But if the truth be told, even the current 80286-based machines simply have more power than the average user has yet digested. Granted, the so-called power users — for example, those who have large applications such as huge spreadsheets — are always yearning for greater speed. But they represent a relatively small segment of the overall PC market.

Now comes a new class of machines that boasts power and speed three times that of the Digital Equipment Corp. VAX 11/780, for years the standard in the mini/supermini-computer world.

Impressive indeed.

Not impressive, however, is the software currently available in the 80386 world. No one cares to predict when an operating system (initially Microsoft Corp.'s MS-DOS 5.0, eventually MS-DOS 6.0) will be available to take maximum advantage of the 80386. Applications software is yet farther away.

True, on the multiuser side, the chip should be popular with Unix system users. Unlike MS-DOS, Unix is better able to take advantage of the chip's power. There are even those who contend that multiuser systems based on the 80386 will cut into the supermini market, competing against VAXes and the like. But that, too, is deceiving: These new machines will not run the minicomputer operating systems so, therefore, cannot compete directly against a VAX running VMS.

All of this, plus the lack of a 80386 standard and the fact that IBM is not expected to announce a 80386-based machine until well into 1987, leads us to think that MIS managers have good reason to bide their time. Power users, indeed all users, can afford to wait — for vendors to work out technical kinks in their systems and for prices to come down in the wake of the 80386 clones that are sure to spring up in the marketplace.



LETTERS TO THE EDITOR

Hacker skirmish improves security

Hackers are only interested in government or bank computer centers, right? They are only going to attempt to get into the super-duper mainframes, right? They are problems that the big shops have to worry about, right?

I used to think that.

I was jarred from this belief one morning when I checked the computer console. One of the first things I do each day is check the console to see if there have been any messages sent to it. What a surprise I got that morning when I saw several log-on notices from the evening before. Since there was no message indicating trouble, I was confused. A quick call to the technical support service center verified that it had not been involved.

The idea of a hacker still did not enter my mind. The shop where I work has a small minicomputer; the staff consisted at the time of one programmer/operator, one secretary and one manager/programmer/everything-else. Our job was to support the county-level educational system with financial applications and student record-keeping. Nothing that could be turned into money or advantage was involved. Since nothing else seemed to be out of the ordinary, I chalked it up to one of the school districts having an evening conference.

The proverbial ton of bricks fell on me the next morning in the form of more logon messages and an open message from the hacker. He wanted to assure me from the outset that he did not intend to cause any harm and that he was interested only in helping me improve the security of the system.

Well, it was as plain as the nose on my face that the system certainly needed some improvement in security, but I did not like his approach.

After several exchanges of messages in which he tried to convince me that his intentions, if not his methods, were honorable, I tried to convince him that, honorable or not, I could not risk the exposure my system was getting, so we parted.

Actually, he parted when I first canceled his session. In the short time it takes to dial a telephone number, he was back. I canceled him again, and he tried again!

I did admire his persistence as well as his knowledge of my passwords. Finally I had to shut down the entire system.

For the next two and a half days, my assistant and I changed every password in every program and every job stream. Since it was obvious that the hacker had access to a very powerful support pro-

gram that displayed any password requested, more was needed. We copied several such powerful utility programs to other locations and gave them meaningless, nondescriptive names.

We copied the entire sets of the technical support programs used only by the service personnel and put them on tape. We added additional levels of security to all systems.

The passwords were completely random, made up of numbers and letters, of varying length. Then we erased all of the original utilities that could be used to unlock the new security. Finally, we changed the electrical connections for all dial-up modems so that all could be turned off at the end of the day.

After we finished, we plugged in the modems and waited. It took less than three hours before the hacker was again trying to enter our computer. He tried for close to two hours, but he could not gain a toehold.

It cost us about a week of time, but we were lucky. Our hacker was not interested in doing damage. Some of the changes we made were changes that I had meant to make for months, even years. Others just came to mind while I was in my paranoid phase. All changes have been useful, I feel, in keeping the hacker from my electronic door.

Donald B. Wentz

Montgomery County Intermediate Unit
Norristown, Pa.

Multipurpose Amiga deserves praise

I wish to make a comment on the lack of articles concerning Commodore Business Machines, Inc.'s Amiga. Besides word processing, which the Amiga is very good at, I use it as a terminal emulator that interfaces at 2,400 bit/sec. into my company's mainframe using VT100 emulation.

My position requires 24-hour technical support of banking and insurance clients and access into various mainframes is crucial to my job.

Sure, the Amiga is new, but many business applications have been written or ported to it, and since Commodore is finally making a profit, the acknowledgement should be made: The Amiga is here to stay.

IBM and the clones are not the only business machines.

Bruce Donnelly
SEI Corp.
Cambridge, Mass.

VIEWPOINT

Computer ads: The cute, the pompous and the obscure

What is the purpose of the title of this article? To get you to read the first sentence. And what is the purpose of the second one, of course. And the purpose of this paragraph and the next? To get you more and more committed until you have read the entire article.

Advertising follows similar rules: The purpose of the headline (and subhead, illustration or photo, if any) is to get you to read the first sentence of the copy and so on.

What kind of headline and sub-head stops you from turning the page? One that is provocative and interesting but that also communicates something about the product and its benefits. The first paragraph? Ditto.

The principles described above — rather briefly — have been proved over and over again, decade after decade, in every industry from buggy whips to radar detectors. But apparently there are those in the computer industry who believe that the computer world is different from the real world and that the tried-and-true marketing rules do not apply. Thus, they have devised an entirely new set of rules.

Rule No. 1: Be cute.

Use headlines like "Open up or

Ahl founded Creative Computing Magazine and is the author of more than 20 books on recreational, educational and professional computer applications.

else," "Made for each other," "We have ways to make you talk" or "Imagine that!" Use pictures of dogs, birds, empty paper bags, racing cars and baskets of eggs in your ads. Since the benefits of using a new computer, peripheral or software package are difficult to communicate, particularly in a single page, do not even try. Hard-headed DP managers are really quite soft-hearted and will be overwhelmed by the photo of two cute puppies in your ad that they will rush right out and buy your product.

Rule No. 2: Do not speak English.

I was particularly drawn to an ad with this head and subhead: "Turbo. Why are Syback & Synchsort CMS the fastest things on no wheels?" Why, indeed? A few pages later in the same publication, I was invited to "attend a free four-hour 4GL/DBMS seminar." In the body copy, I learned that the so-called 4GL turns out to be just SQL or C. And then there is the "Speedup" product (I'm not even sure if it is hardware or software) that lets you "switch from five frequencies including the standard 12 MHz. Uses reliable frequency synthesis to allow compatibility with all IBM ATs including the Type 2 and Model 239." Sounds terrific.

Rule No. 3: Use celebrities.

Find a spokesman who is well known and well liked. Very few of these people know anything about



By DAVID H. AHL

computers, but that makes no difference. Customers will buy anything celebrities tell them to. Just look at the success of Alan Alda, David Banner, Roger Moore, Dom DeLuise, William Shatner and John Cleese. (You get ten points if you can name the computer that each of these celebrities hawked.)

Rule No. 4: Do not mention price.

Although in industrial advertising leadership studies, 97% of the respondents say they are more likely to read an ad that shows price, you can assume either or both of the following: They do not want to see prices that are over \$13.95, or price does not really matter because it is the company's money. Instead of showing price, use phrases like "outstanding value," "investment in the future" and "more features for less money."

Rule No. 5: Use meaningless superlatives.

A word processing package claims to have "unsurpassed business features." That is certainly tough to argue with. How about the company whose "computers are so advanced that we win more major contracts than anyone else"? And then there is a board manufacturer that promises that "performance exceeds demand." Whose demand, theirs or mine, is not specified. One company claims to have the "fastest DASD management system." If you define your own uni-

verse narrowly enough, it is not hard to have the fastest — as well as the only — direct access storage device product in it.

But if your product is not faster or better, and it falls in a well-defined product category, what do you say then? That is easy. Follow the lead of one software manufacturer and call it "the emerging standard."

Rule No. 6: Choose a pompous, wordy slogan.

Remember slogans like "I'd walk a mile for a . . ." or "things go better with . . ." or "breakfast of champions?" Sure you do. And I will bet you can name the products in two seconds. Now, contrast those punchy slogans with these gems from the computer industry: "together, we can find the answers," "the leader in information systems software," "in touch with tomorrow," "superior software by design," "a superior way for organizations to solve key data processing problems" and "we're developing technology for you." (Points will be awarded if you can identify just one company from the above slogans.)

Those who follow these rules to the letter and find that sales are declining may want to strike out on their own and follow the lead of companies like SAS Institute, Inc., Televideo Systems, Inc. and Teknowledge, Inc. Unlike the majority in the field, their ads are punchy and informative, communicate benefits and price and make me want to buy the products. And that's what it's all about.

In defense of the relational DBMS model

As a development manager with more than 15 years' experience evaluating and using a variety of data base management systems and other software development products, I am not surprised that there are usually a variety of opinions on the best techniques, tools and products to provide DP support for various business uses.

What does surprise me, however, is the wave of ongoing misconceptions and resulting misstatements concerning the relational DBMS model and its various implementations. I see a need to try to establish a better and broader perspective on what this relational DBMS theory and practice is all about.

I would like to offer the following thoughts on the relational model:

- The relational model is just that — a model. A model that by itself cannot accomplish any useful units of work but certainly can and does serve as a guide for vendors in designing DBMS implementations. However, in making comparisons or criticisms, one must be consistent and not attribute failings or problems with a particular implementation to the model itself, if the feature in question in fact is part of the model (and

vise versa).

For example, the model calls for referential integrity rules to be present, but some relational implementations do not have this feature fully implemented. Therefore, one could contend that the model does not need referential integrity or that the given implementation does not adhere to the model. But to say or imply that because a given implementation does not have referential integrity, the model does not need it, is not only faulty logic, but also incorrect.

- The relational model is grounded on well-defined mathematical set theory, and its originators, E. F. Codd and Chris Date, are noted practitioners with many successful DBMS and operating system implementations at IBM. Further, there are already some vendors that are developing more efficient, sophisticated and complete implementations of DBMS that adhere to the relational model.

Much as earlier nonrelational DBMS implementations evolved over time to provide greater capability, efficiency and functionality, so too will implementations of the relational model.

One of the most basic and important features and requirements of the relational model is the separation of the way data is presented to end users

and programmers, from the way it is physically defined, structured, stored and accessed. Thus, not only is there no specific physical data access method required or prescribed by the model, but, conversely, various physical data structure access methods can be theoretically compatible with an overall relational implementation.

Successful vendors will continue to provide for including existing physical access alternatives

along with newer and better physical access and structure methods that can continue to change and improve as the technology allows.

- The relational model is based on well-founded mathematical theory, which is unintelligible to many of us; thus, Codd has also described the model in terms of rules or functions that must be present for any implementation to meet relational criteria. In doing so, he is not stating that any particular vendor's product must follow these rules to be successful, but merely that any such product must follow these rules if it is to be considered as relational.

Herein lies the source of many misconceptions and myths. Certain vendors and other critics have taken exception to the various rules (usually ones their products do not have). They have tried to imply that their

own criteria and interpretations are more valid or correct, but to preserve some of the benefits attributed to the model, they use such wording as relational-like, relational-based, near-relational, relational-flavored and so on. To eliminate such partial truths, critics ought to either create their own separate fully defined relational model (and identify it as such) or eliminate all reference to the term relational and just concentrate on features and functions provided.

- From a good business standpoint, users should not be looking to acquire a relational DBMS — they should instead define a set of business requirements and related evaluation criteria for the functions they want a DBMS to do for them. Then the various products available can be evaluated objectively on business criteria and not empty and confusing buzzwords.

The real promise of the relational model is not yet realized in the sense that no current implementation provides all the solutions and capabilities the user community is looking for, but there are certainly indications that progress is being made. It is at this level of practical implementation capabilities that our industry should spend the time evaluating, criticizing, correcting and moving ever forward in making our lives easier, users happier and our companies more profitable.

Announcing what IBM didn't.

A 3270 plug compatible control unit with ASCII host support. NOW.

Recently, IBM announced they will offer (next year) a subsystem control unit that will access both 3270 and ASCII hosts. They didn't announce it is available now. Ours is. The Telex 274-C2 control unit offers ASCII host support today. Plus, we offer another more significant advantage.

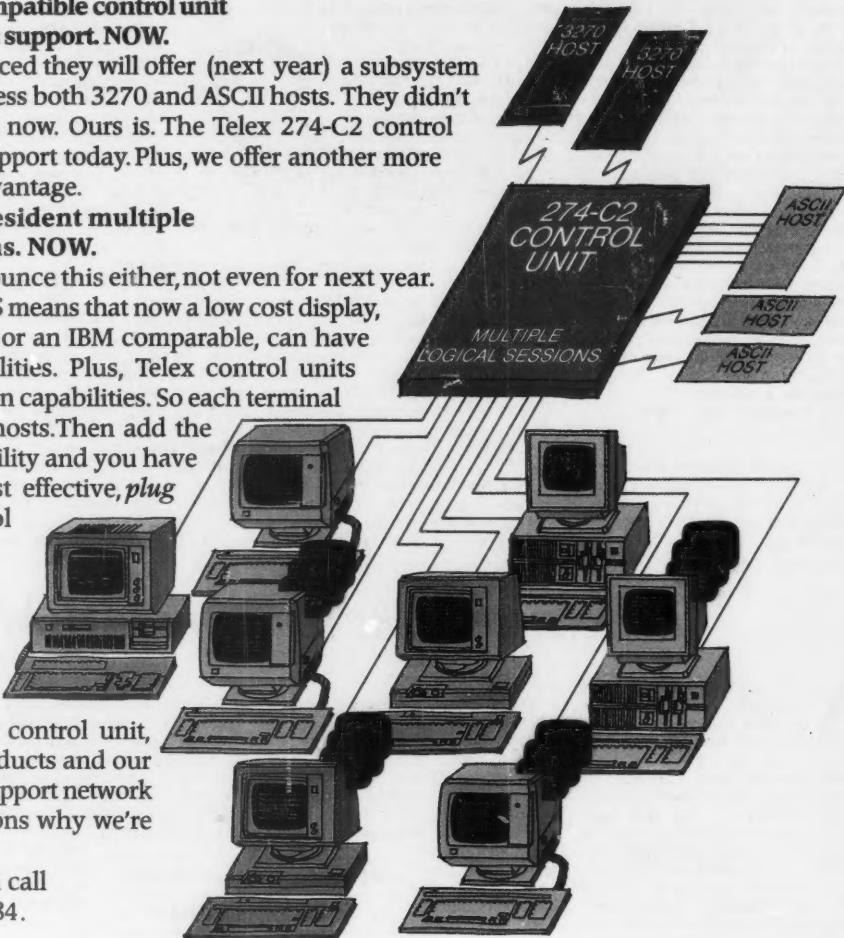


Control unit resident multiple logical sessions. NOW.

IBM didn't announce this either, not even for next year. Control unit resident MLS means that now a low cost display, whether it's a Telex 078 or an IBM comparable, can have multiple session capabilities. Plus, Telex control units offer dual communication capabilities. So each terminal can reside on multiple hosts. Then add the 3270 or ASCII connectability and you have the most functional, cost effective, *plug compatible* 3270 control unit available. Today. Or tomorrow.

If you want solutions today, call Telex today. Waiting could be unnecessarily expensive. The innovative 274-C2 control unit, our full line of 3270 products and our worldwide service and support network are just part of the reasons why we're the #1 3270 alternative.

For more information call
1-800-331-2623 Ext. 3284.



The #1
3270 Alternative.

TELEX

TELEX COMPUTER PRODUCTS, INC.



IBM is a registered trademark of International Business Machines Corporation.
Telex is a registered trademark of The Telex Corporation. Printed in USA. 8/86.

SOFTWARE & SERVICES



SOFTLINE
Frank Sweet

Dictionary for data's data

A data dictionary is a computerized collection of record layouts. To support data base applications, it must include five features: data processing documentation, user documentation, independent data elements, accessibility to application languages and accessibility to the data base management system.

Record layouts tell what kind of data is found in a file. A personnel file's layout, for example, shows that each record holds an employee number, name, job title, salary and the like. For each data item, the layout tells how long the item is (name might be 50 letters long, job title might be 15), whether arithmetic may be performed on it ("yes" for salary, "no" for employee number) and, if so, how the number is encoded (binary, floating point, packed decimal).

The personnel file's layout is a blueprint or template to which every employee record conforms. The layout itself tells nothing about any particular employee; that is the role of the records described by the layout. In other words, the personnel file holds information about employees. Call it "people data." The layout holds information about the data in the personnel file — data about data. In philosophical terms, I suppose, one could call it "metadata."

Developers must know the size, format and encoding of a file's data items

See **DICTIONARY** page 21

Sweet is a free-lance data base consultant in Jacksonville, Fla. He publishes "Boxes and Arrows," a monthly newsletter for Cullinet Software, Inc. IDMS users.

Mapper gets application kit

Reactions mixed to tool's documenting requirements

By Charles Babcock

BLUE BELL, Pa. — A computer-aided tool kit has been added to Mapper, Sperry Corp.'s fourth-generation application development system, to help users design, build and maintain applications.

Mapper Kit earned a good review from an early user, Barney J. Foster, Mapper administrator at Nike, Inc., a Beaverton, Ore., athletic shoe manufacturer.

Another early user, Carnival Cruise Line of Miami, Fla., dropped its use of the kit after an initial trial because it did not want to commit its resources to the documentation requirements of the system, said William Ball, manager of system support. "We're a very unorganized shop. Mapper Kit imposed a lot more documentation than we wanted," he said.

Mapper is an end user-oriented system with an associated data base management system that has been in use for 18 years within Sperry and generally available for six years. It has an installed base of 2,000 units and runs on Sperry mainframes, mini and micro hardware, Sperry officials said.

Mapper has won praise from Arthur Young & Co. and James Martin Associates for its ease of use and broad set of information processing facilities.

Adding the tool kit to Mapper addressed several weaknesses that were inherent in the product, according to Foster, a Mapper user for five years and a beta-test site of Mapper Kit for the past 18 months.

Although Mapper allows quick application development, the Mapper Kit imposes discipline on design and documentation phases, he said. "It's nothing really spectacular, but it does allow us to do some good analysis and structured design," he noted.

See **MAPPER** page 20

NEW THIS WEEK

■ Martin Marietta offers an on-line bulletin board for Ramis II users

■ For more on this and other new products, see pp. 73-88.

INSTANT ANALYSIS

"Language is not crucial to the user. The language best suited for an expert system is the one that allows a user to write a program that calls the inference engine."

— John B. Landry, chairman of Distribution Management Systems, Inc., on the debut of Impact/AE, an expert system shell

M&D promises; users want action

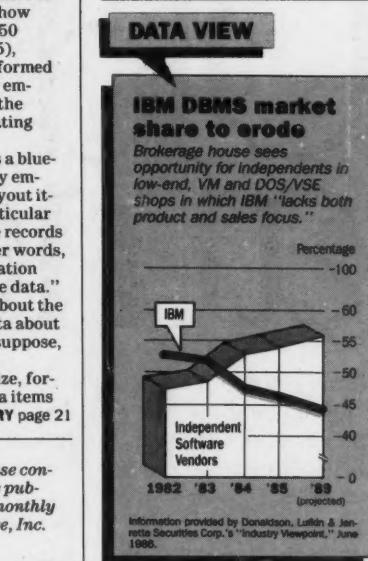
By Maura McEnaney

RENO, Nev. — At McCormack & Dodge Corp.'s Ninth Annual User Group meeting in Reno, chief executive Frank Dodge pointed to his company's recent reorganization as its strongest asset.

It has been more than a year since M&D saw the defections of technology guru John Landry, chief architect of the company's Millennium fourth-generation language, and Vice-President of Marketing Bob Weiler. Since then, M&D has completed a major reorganization [CW, Aug. 18] and added several key employees, including former ITT software specialist John Birch as vice-president of research and development.

Industry observers have wondered how the departures would affect the financial applications software company, and Dodge's introductory remarks at the Bally's Grand Hotel in Reno attempted to soothe some of those concerns. "We now have a stable, unified executive com-

See **M&D** page 20



With ORACLE version 5, you save half the computer you thought you needed in order to "go relational"... some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROS?

REASON #1: AI OPTIMIZES QUERY PROCESSING.

V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue and accounts over \$10,000." But only ORACLE can optimize "Select accounts 90-days overdue or accounts over \$10,000."

REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with logical sets of data. But they manipulated only one physical record at a time. V5 eliminates

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5



overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

REASON #3: PARALLEL PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared

code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION.

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

REASON #6: EFFICIENT ROW LEVEL LOCKING OPTIMIZES TRANSACTION THRUPT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the

first time, high transaction throughput is achieved by a true relational DBMS.

THE ULTIMATE REASON

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today ORACLE is installed on thousands of minis and mainframes, and over ten-thousand PCs. ORACLE is the only SQL-compatible relational DBMS that's portable across IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. And ORACLE applications and databases are connectable across different hardware and operating system, providing you with a truly distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write Oracle Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

SOFTWARE & SERVICES

Graphics standard tool debuts

CGM implementation for DEC VAX to ship

By Rosemary Hamilton

AUSTIN, Texas — Nova Graphics International Corp. recently said it plans to begin shipping a software package based on the emerging Computer Graphics Metafile (CGM) standard for Digital Equipment Corp.'s VAX line late this year.

The CGM is currently under review by a committee of the American National Standards Institute (ANSI). It would provide a standard file format in which all graphics files would be stored, transmitted and retrieved.

M&D promises; users want action

From page 19

mittee," Dodge told the 1,750 users at the meeting.

However, conference attendees seemed more concerned about new product deliveries than the company's management team.

"They say they are committed to delivering more products, but they're announcing a reorganization — you have to put more than reorganization into it," said Robert Fournier of Tropigas International Corp. in Coral Gables, Fla.

Instead of news about corporate reorganizations, Fournier said, he wanted news of new products for IBM's System/38 line. Tropigas now uses M&D's General Ledger package for its System/38 and is eager to purchase other accounting packages.

"We went with McCormack & Dodge so that we could offer a total integrated package," he told *Computerworld*. Without other product offerings, Tropigas will buy from other vendors and integrate the systems themselves, said Tropigas' financial systems analyst Jeffrey Pines.

Although the reorganization calls for changes in the management ranks, users are directly affected by a change in M&D's software support arena.

Under the reorganization plan, which will be phased in during the next year and a half, support account managers will be assigned to customers on a geographical basis and will serve as the single contact point for all system implementations.

For West Coast users like Northrop Corp.'s aircraft division in Hawthorne, Calif., the change is a positive one. "We are getting better support from the Los Angeles office," said Mel Gentleman, project administrator of the finance systems. But Gentleman added, "M&D has to start addressing 24-hour support."

Other directions outlined by Dodge and executives at the conference include the company's commitment to provide support for selected products to be used with IBM's DB2 and Cullinet Software, Inc.'s IDMS/R, expanded international efforts, increasing the number of generic financial applications and an emphasis in distributed data processing and technologies like artificial intelligence.

Mapper gets application kit

From page 19

The kit includes a business problem modeling facility, Sum, with which a user may define, specify and analyze the information flow of a particular task, said Michael Shearer, manager of Sperry's Mapper development.

A second component, Kitbuild, provides automated documentation of the application design. The documentation formats are standard and match the development stages in the problem modeling process, he said.

Kitbuild also provides a data dictionary for the application and can provide color diagrams of the data

flow, Shearer said.

A third component, Kitaid, is intended to allow Mapper end users to maintain their applications through commands like Adjust, which allows modifications to fields or processing instructions without disrupting the rest of the application, Shearer said. Any modifications automatically realign the documentation and data dictionary, he added.

He added that the structured analysis feature allows users to break their applications down into smaller and smaller pieces as the system provides data consistency.

Changes to applications may lead to maintenance problems because end users cannot be counted on to make changes consistently through 50 or 60 programs, Foster said.

Mapper Kit retails for \$15,000, or \$980 per month on a lease agreement.

Old name.

For six years our name has been
Relational Database Systems, Inc.
But more people know us by the name
of our leading product.

INFORMIX®

It's the best-selling RDBMS* in UNIX®
And now it's making quite a name
for itself in MS-DOS and computer
networks.



RELATIONAL DATABASE SYSTEMS, INC.

SOFTWARE & SERVICES

Dictionary for data's data

From page 19

in order to write programs that store data into or retrieve data from it. So, record layouts have been an essential to application documentation since long before the data base notion became possible. Until the mid 1970s, record layout collections were often kept in three-ring binders.

In the early 1970s, commercially available data base management systems made the idea of centrally shared data pools technically feasible. In a few years, it grew evident that the idea would work only if record layouts were automated. If each new application were to take advan-

tage of existing data, developers and users both had to know what was out there with more precision than ever before.

Absolute precision, however, is rare in human affairs. Manually maintained record layouts inevitably contain a few errors, some typographical, others resulting from the copy being slightly out of date. ("Slightly out of date" for record layouts, by the way, is akin to being

"a bit pregnant" or "somewhat dead.")

For stand-alone applications, minor documentation flaws are a nuisance. But they can be tolerated because the developer must be intimately familiar with every aspect of the application anyway — there is no one else.

Data base applications, on the other hand, cannot as easily tolerate even minor errors. Potentially, these

applications offer the promise of reduced development costs: We can take advantage of data already recorded by others. To reap the reward, however, developers must be able to find out, with little effort, what is in the data base. Effort means cost.

If fact-finding demanded detailed examination of the files, the effort would be spent, the price paid, the promise broken. In short, minor errors in metadata, a nuisance to stand-alone development, destroy one of the very reasons for building data base applications.

Today's dictionaries offer absolutely accurate essential metadata (item length, format and encoding). It is their unsung history-making achievement. Few events have affected the application-building industry as profoundly as the simple fact that, for the first time, we have record layouts that are truly, really, 100% accurate.

How do they do it? Putting data in a computer does not, of itself, make it any more reliable. Record layouts, automated or not, are simply documentation, when you get down to it. And documentation, despite our best intentions, has low priority. The answer: We pay closer attention to things that threaten us. We shall explore this in a moment. First, we will look at metadata from the user's viewpoint.

Data base users need precise information about their data. In a nutshell, data base means your accounts payable manager agrees to use vendor data recorded by the purchasing department. Agreement hinges on confidence, and confidence depends on knowing the details.

Who in purchasing is responsible for it? How often do they update it? How is it validated? How often do they make mistakes? If I see an error, may I correct it or must I ask purchasing to do so? The questions are as hard to predict as they are important. The answers should be recorded in the dictionary.

The second function of a data dictionary, then, is to store facts about the data base that, although irrelevant to DP, are vital to our users. The challenge to dictionary makers is that, in contrast to DP metadata, you really don't know which questions users consider important until they ask them. Hence, a dictionary should let you define new classes of data about data.

A dictionary's third function is to enable us to record, in one place, facts about a data element that do not vary from one record layout to the next. Employee numbers, say, may appear in the data base's personnel record (as its key), in the department record (identifying the unit manager), in the maintenance work-order record (the engineer responsible) and in many others.

Nevertheless, common sense dictates that, wherever it is used, in whatever program it appears, the employee number must appear as "EMPLOYEE-NUM," nine characters long and not encoded for math.

Consistency of data about data is as important as consistency about anything else. We put vendor address in vendor master records, not in every purchase order. Similarly, data about the abstraction "employee number" should be recorded in a file of data element definitions, not in every record layout in which it appears.

New name.

Well, guess what. We've finally come around and changed our name to the one more people already know.

INFORMIX.

For information on INFORMIX-4GL, INFORMIX-SQL, C-ISAM and all our products, call or write Informix Software, Inc., 4100 Bohannon Drive, Menlo Park, CA 94025. (415) 322-4100.

INFORMIX

Why the least expensive mainframe financial software may not be the best deal.



In mainframe financial software, as in anything else, you get what you pay for. Remember that when you read about rampant discounting and price slashing. At Data Design, we don't cut our prices to make a sale. That's because *after* the sale we don't plan to cut service and support, either. So, while getting a "bargain" may make your day, we'd prefer to make your next ten years.

We have a hard-earned reputation to uphold. A reputation built on 13 years of providing the highest quality systems and support in the mainframe industry. And nationally recognized independent software surveys confirm Data Design's unsurpassed record of user satisfaction—year after year.

We believe that the fast, trouble-free installation and responsive, knowledgeable support by *management level* people is worth what we charge for it. So do companies like Alcoa, Gerber,

Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds of other FORTUNE 1000 companies who choose Data Design over other major vendors.

Our customers know that it's important to keep the purchase price in perspective. The cost of a mainframe system is comprised of three elements: 1) The purchase price of the package; 2) The cost of installation and conversion and 3) The cost of daily system operation and maintenance. Of these three cost elements, the first is by far the smallest. What's the point of saving even \$50,000 on the purchase price if implementation and operations costs eventually add several hundred thousand dollars to the total? The trouble with cheap financial software is that you may never stop paying for it.

Financial software by Data Design. When you can't afford anything but the best.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
CAPITAL PROJECT MANAGEMENT

Learn more about the best financial software available. Call Betty Fulton toll-free at 800-556-5511 today.

DA DATA DESIGN
ASSOCIATES
Excellence in financial software. By design.
1279 Oakmead Parkway, Sunnyvale, CA 94086

COMMUNICATIONS



DATA STREAM
Daniel Minoli

Choice: T1 or channel bank?

One of the success stories in data communications in the past two to three years has been the rise of T1 multiplexers. T1 (also called DS1) facilities that carry data at 1.54M bit/sec. were initially available only for internal use by telephone companies. Around 1980, the telcos began offering leased T1 lines to end-user subscribers as a "specially engineered facility."

In 1983, T1 services became generally available as tariff offerings from Bell operating companies. Several divested Bell operating companies now offer a tariffed DS3 service over fiber in certain areas.

T1 multiplexers divide a T1 channel into subchannels that can be routed separately to different destinations. Revenue for this equipment rose from \$30 million in 1983 to an estimated \$150 million in 1986, and the 70% compound growth rate is expected to continue at least until 1990.

Originally, T1 multiplexers were an outgrowth of another type of telco equipment, the channel bank. One key question that many MIS and telecommunications managers should currently be asking themselves is, Should I buy a channel bank or a T1 mux? Here are some facts to consider.

Both T1 muxes and channel banks multiplex multiple lower speed channels into a DS1-range channel. However, channel banks were designed to han-

See CHOICE page 28

Minoli is an adjunct assistant professor with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

ISDN conformity tests out

Bell Northern facilities open to users, vendors

By Elisabeth Horwitt

OTTAWA — Two testing facilities for determining products' conformance to Integrated Services Digital Network (ISDN) protocols are now being made generally available to vendors and users on a good-will basis, Bell Northern Research announced last week.

The facilities are based on a Northern Telecom, Inc. DMS-100 central office switch. Bell Northern's ISDN-Test and Traffic Simulator (ISDN-TATS) performs overall testing to verify whether a network meets the emerging industry standard's performance specifications for transmitting voice, data, video and text over the same digital connections, said Cho Lun Wong, director of Bell Northern's ISDN Planning Program.

The CPE Test Facility enables customer-premise equipment (CPE) vendors to test

their products for ISDN conformance "without having to install them on an actual ISDN network," Wong added.

The facilities have been operational since June. Northern Telecom, which owns 70% of Bell Northern, is already using the facilities to test the ISDN compatibility of its central office and customer-premise equipment that will be used in ISDN field trials later this year, Wong said. The facilities have also been available to third-party vendors whose equipment will be used during the trials.

Bell Northern's facilities will be used to pretest CPE that will be used in an ISDN trial cosponsored by Northern Telecom and divested Bell operating company Mountain Bell. Scheduled to operate from November to at least May 1987, the trial's ISDN network will connect DMS-100 switches installed on four Mountain Bell central office facilities with customer-premise equipment installed at Mountain Bell and the state of Arizona's departments of Transportation and Administration.

See ISDN page 25

INSIDE

Tridom unveils VSAT satellite-based data communications product/24

PBX 1985 growth figures are misleading, report says/25

IBM offers European users free OSI testing/25

NEW THIS WEEK

Honeywell introduces its HFM5300 fiber-optic modem

For more on this and other new products, see pp. 73-88.

INSTANT ANALYSIS

"Telex vendors need to join the Electronic Data Interchange market rather than fight the tide; sending documents directly from computer to computer is a lot faster and more reliable than rekeying a Telex into the system." — Morton Goodfriend, consultant to ITT Worldcom

PCs access mainframe graphics

By Alan Alper

NORCROSS, Ga. — Four graphics terminal emulation boards recently introduced by Digital Communications Associates, Inc. (DCA) provide IBM Personal Computers and compatibles with the ability to generate mainframe graphics while operating as IBM 3270 terminals.

The firm also unveiled a hardware and software package that provides IBM Personal Computers and compatibles with the multiwindowing, multisession functionality of an IBM 3270 Personal Computer workstation.

The products enable PC users to generate high-resolution, presentation-quality graphics in terminal mode, then store them on a disk or send them to a plotter for hard-copy generation, DCA claimed. They eliminate the need for both a graphics terminal and PC on a user's desk, said DCA Marketing Vice-President John C. Bacon.

Each of the products works in conjunc-

tion with Graphical Data Display Manager (GDDM), IBM software for creating mainframe graphics on 3270 graphics terminals. They are compatible with an assortment of mainframe-based graphics applications packages, including IBM's Interactive Chart Utility and third-party products like Issco's Tell-A-Graf and SAS Institute, Inc.'s SAS/Graph, DCA said.

Environments supported by the graphics boards include IBM Systems Network Architecture (SNA) and bisynchronous, local, remote and stand-alone modes in which Control Unit Terminal or Distributed Function Terminal technology is used. Irma 3279 Graphics, an IBM 3279 emulation board, gives PCs and compatibles with 3279 S3G Programmed Symbol mainframe color graphics in any IBM environment.

The board also provides the same terminal emulation and file transfer capabilities as DCA's Irma terminal emulation board.

See PC page 24

SYSTEM 2000® DBMS for Only \$12,000

All the Extras Without the Extra Costs

You don't have to spend a bundle to get a full-function data base management system. For a first-year fee of \$12,000, SYSTEM 2000® DBMS gives you:

- an integrated data dictionary
- on-line query/update
- a report generator
- relational data base access
- programming language interfaces
- high-quality training and technical support.

Renewal rates are even lower. Plus, you can now link SYSTEM 2000 DBMS with the SAS® System of software to build data bases, store and retrieve data, merge and manipulate data, perform your analyses, and produce reports and presentation graphics. You can even give Information Center users access to your DBMS through easy-to-use SAS menus.

Before you invest a bundle, find out why SYSTEM 2000 DBMS is the most economical data base management system in the industry.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA.
Copyright © 1986 by SAS Institute Inc. Printed in the USA.



SAS Institute Inc.
Box 8000, SAS Circle
Cary, NC 27511-8000
(919) 467-8000 Telex 802505

COMMUNICATIONS

Tridom aims fault-tolerant VSAT system at financial firms

Claims cost reductions over leased-line nets

By Stanley Gibson

ATLANTA — Tridom Corp. recently announced Clearlink, a very small aperture terminal (VSAT) satellite system with fault-tolerant features aimed primarily at financial service companies.

The system was designed to reduce costs 30% to 60% for two-way networks, compared with the cost of leased lines, according to Tridom.

Howard Lukens, Tridom marketing manager, said the system has been well received by brokerage

houses and insurance firms for use in their interactive networks for such tasks as buying or selling stocks and bonds and broadcasting financial information. Banks have also found the system useful in transmitting branch office to data center transactions, he said.

"I think the financial industry is fertile ground," offered John McQuillan, president of McQuillan Consulting in Cambridge, Mass. "The retail industry was the first to really go VSAT. The financial industry is second," he added.

The Clearlink network is composed of 1.2-meter dishes located at the customer's branch offices and communications over a Ku-band sat-

ellite to a shared master hub station that is connected by leased lines to the customer's host computer.

Network control and diagnostics are handled by a fault-tolerant computer at the hub station. A customer can be in constant touch with the hub's network control computer through a terminal on his premises.

Fail-safe feature

According to Tridom, a fail-safe feature is also available that automatically dials the closest earth station or the hub through a built-in modem, should a remote station cease to function.

Clearlink supports Synchronous Data Link Control, bisynchronous

and asynchronous communications protocols. A link-level communications protocol is used to ensure complete end-to-end data integrity, the manufacturer said.

Clearlink can also concurrently run several applications, including interactive data, broadcast data services, data upload or download, video teleconferencing and certain broadcast voice applications, such as the brokerage industry's "hoot and holler," in which person on the trading floor of the stock exchange transmits information about trading prices one-way to a number of brokers.

Priced at \$7,500 per site, the system will be available this month.

NOTHING SHOWS IT QUITE LIKE A QUIMAX.

Introducing the PX-22 BGA monitor. Graphic proof that quality doesn't have to be expensive.

At Quimax, we believe a computer monitor's performance and features should not be based on price alone. You see, we haven't forgotten the meaning of value.

Take our new PX-22 BGA color monitor, for instance. We gave it an extra-large 13" diagonal screen for a bigger picture. A .31 mm dot pitch tube for sharper character definition. 60 Hz, non-interlaced scanning for flicker-free images. Crisp 720 x 590 resolution. And a price tag that's a lot less than you imagined.

Pleasing to the pallet.

But here's where the PX-22 shows its true colors. It works with both the IBM® Enhanced Graphics Adapter and Color Graphics Adapter. The monitor automatically adjusts to the correct scanning frequency. Giving you a rainbow of dazzling colors to choose from. 64 with BGA. 16 with CGA.

For text applications, there's a convenient front-panel button that lets you switch to a green or amber display.

IBM, PC, AT and PC XT are registered trademarks of International Business Machines Corporation.

And speaking of convenience, the PX-22 even comes with a detachable tilt and swivel base. At no extra charge.

A keyboard that's easy to play.

Is your present keyboard suffering from "creative" key placement? Then wait 'till you get your hands on a Quimax KM-5170.

84 sculptured keys, positive tactile feedback, and a built-in microprocessor make data entry a snap. A special plug-in feature also makes the keyboard compatible with the IBM PC XT® and PC AT®... eliminating the need for tedious manual switching. The KM-5170 is available

in DVORAK and foreign language layouts.

The new Quimax PX-22 BGA monitor and KM-5170 keyboard. High performance without the high price. See them in action at your nearby Quimax dealer today.

Quimax

Quality and value, with a twist.

Quimax Systems, Incorporated
844 Del Rey Avenue
Sunnyvale, CA 94086
Tel: (408) 773-8282
INSIDE CALIFORNIA: (800) 232-8282
OUTSIDE CALIFORNIA: (800) 228-0530

Quimax family of products

PX-32

13"

PC gets graphics from mainframe

From page 23

It is available in two versions: one board combining graphics and DCA's Irma board terminal emulation functionality lists for \$1,995, while the upgrade for use with an existing Irma board costs \$1,195. Both will be available in September.

The Irmamax All Points Addressable Graphics board provides graphics to PCs and compatibles within a distributed function terminal configured controller environment. It allows host graphics to be stored and printed locally and supports Virtual Device Interface/Computer Graphics Interface-compatible software.

The complete product sells for \$1,695. An upgrade board for existing DCA terminal emulation boards Irma or Forte PJ lists for \$795. Both will be available in October.

DCA also brought out Irmamax PS Graphics, a release of its Irmamax Graphics board that offers three additional enhancements: file transfer capabilities, bisynchronous compatibility and light pen support.

Irmamax PS Graphics lists for \$1,595. An Irma board upgrade can be purchased for \$795. Both versions will be available in October.

In addition, DCA unveiled a board that provides APA graphics capabilities for remote PCs via controller emulation. Called Irmacom APA Graphics, the board emulates an IBM 3274 controller and a 3270 display, offering remote PCs in an SNA environment the same functionality that Irmamax APA Graphics provides to local PCs. Available in October, Irmacom APA Graphics lists for \$1,295, DCA said.

Another DCA introduction, Irmamax Multisessions, provides the IBM PC family and compatibles with Distributed Function Terminal multisession capabilities and windowing capabilities featured on the 3270-PC. PCs equipped with Irmamax Multisessions can simultaneously display one PC-DOS session, two notepads and up to four host applications.

Irmamax Multisessions is available as a complete package including expansion board and software for \$1,495 or as an upgrade to an existing Irma or Forte PJ terminal emulation board for \$595. Both versions will be available in October.

COMMUNICATIONS

Line shipments peak, but PBX demand expected to subside

Present plateau due to add-ons, conversions

By Elisabeth Horwitt

NEW YORK — Despite a 12.6% surge in line shipments in 1985, private branch exchanges (PBXs) are suffering from an overall sales decline that should continue through 1990, according to a recent PBX market report by Northern Business Information, Inc.

The New York research firm attributes increased line shipments to a "higher number of add-on shipments in 1985 and larger average system sizes," pointing out that the number of new system shipments in 1985 was 3.4% lower than 1984 levels.

"PBX line shipments will peak in 1987. I doubt systems will go up at all this year," says Northern Business senior analyst William Rich, adding that the most recent spurt of PBX sales was fueled by companies converting from analog to digital PBX systems. The majority of companies will have completed conversion by 1987, according to the report.

Northern Business' report predicts that by 1990, 91.3% of the installed PBX base will be digital, and PBX sales will have declined to less than \$3 billion (see chart). "The next

big increase in sales should come in the 1990s, when the average digital system will be eight to twelve years old and ripe for replacement," Rich says.

The market slowdown is aggravating an industry shakeout that threatens the smaller suppliers, the report says. Top players AT&T, Northern Telecom, Inc., Rolm Corp./IBM, Mitel Corp. and NEC America, Inc. expanded their total market share from 71% in 1984 to 75% in 1985, Northern Business says.

"With the erosion of the analog base, many of the second-and third-tier PBX suppliers will disappear — the market simply will not support them," the report predicts.

Survival in the shakeout depends most on having a large installed base

of digital systems that constitute an aftermarket for add-on equipment such as peripherals, new sets of terminals and new lines, Rich notes.

"Large suppliers like AT&T that offer a wide range of net equipment will do well. If you only have a switch and nothing to sell with it, you're caught out." AT&T, Northern Telecom and Rolm have tightly controlled distribution, so they'll know where to market their equipment."

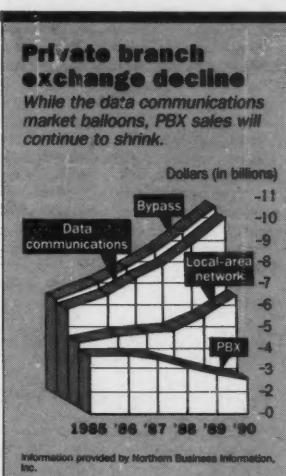
However, AT&T has an extensive analog base that is "still open to attack from competitors," Rich says. "We think they might push Integrated Digital Network [ISDN] connectivity to ward this off. AT&T Communications can start sending business traffic on a D chan-

nel. For instance, AT&T is thinking of using the D channel to transmit call-screening information of value to telemarketers and commands that would automatically call up the caller's account file on the user's screen.

By pushing the entire PBX industry toward adoption of ISDN standards, AT&T would make obsolete all current PBX systems, including its own, Rich says. "But AT&T is ahead of most vendors in converting its customer-premise equipment to ISDN, which would give them at least a temporary advantage even over companies like Northern Telecom."

The same five years that see continued PBX sales decline will also be a growth period for PBX-related products such as integrated voice/data terminals, data PBXs, local-area networks, modems, multiplexers, protocol converters and packet-switches, the research firm predicts. This market will climb to \$8.6 billion by 1990, growing at a compound rate of 27.5% per year, the report states.

As PBX vendors focus on the PBX aftermarket, they will concentrate on major distribution channels such as Centel Business Systems and the seven regional holding companies' equipment subsidiaries, while moving away from independent telephone companies and "Mom and Pop" supply houses, Rich says.



IBM offers European users free OSI testing to verify implementations

By John Lamb

CW Communications International News Service

NICE, France — IBM users will soon be able to check their implementations of the International Standards Organization's Open Systems Interconnect (OSI) standards with IBM's version of the same OSI functions. In October, IBM will launch a verification program in Nice that will allow users to dial up and put their communications software through its

paces with IBM's.

The service, free to European users and vendors, will be accessed via public packet-switched networks, and candidates must provide their own applications test software.

Last year, IBM launched development software called the Open Systems Transport and Session Support designed to allow users to develop OSI software for Layers 4 and 5 on the OSI model.

grated Services [ISDN] connectivity to ward this off. AT&T Communications can start sending business traffic on a D chan-

TURNS Spaghetti Code COBOL Into Structured COBOL Automatically

SUPERSTRUCTURE takes your unstructured COBOL programs and automatically produces structured COBOL programs that are easy to understand and maintain.

SUPERSTRUCTURE provides a simple and cost effective alternative to manually rewriting those unstructured programs that are a maintenance nightmare. Of course you can't believe it. Let us prove SUPERSTRUCTURE works, using your programs at your location. SUPERSTRUCTURE—the breakthrough you've been waiting for.

Call today: Marketing Director—

SUPERSTRUCTURE.

Group Operations, Incorporated
1110 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 887-5420

Offices in: Atlanta, Boston, Chicago, Dallas,
Los Angeles and New York



ISDN conformity tests available

From page 23

Vendors supplying the equipment have not yet been announced. The trial will use the basic ISDN interface that specifies two 64K bit/sec. digital channels plus a separate signaling channel.

"It's useful that CPE vendors can test their equipment for ISDN conformity and correct mistakes at the Bell Northern facility before implementing them on the network," noted Mountain Bell spokesman Robert Meldrum. Equipment will be tested at Bell Northern on Sept. 1, he added.

"I'm not surprised that Northern Telecom is making the Bell Northern testing facility available for CPE vendors to test compatibility with the DMS-100," said Susan Lehto, senior analyst at Boston-based research firm the Yankee Group.

"They were the first to push for

multivendor interoperability with their 'Open World' concept; it would be strange, and dangerous, not to extend this openness to ISDN equipment. AT&T has a similar facility for testing ISDN compatibility with its 5ESS digital switch," she said.

Lehto pointed out, however, that different vendors' central office switches still cannot communicate on the same ISDN network.

"It's critical that the central office switch vendors like AT&T and Northern Telecom work cooperatively. [CPE interface chip vendor] Intel Corp. said to me, 'People all say yes to ISDN standards, but each company interprets it differently,'" Lehto said.

"There is no guarantee that an ISDN-compatible terminal will communicate with different vendors' switches, because ISDN is not firm yet," Wong said. "Too many pieces of the protocol are still left open for definition." He estimated that true ISDN compatibility among different switches would take place by 1988 or 1989.

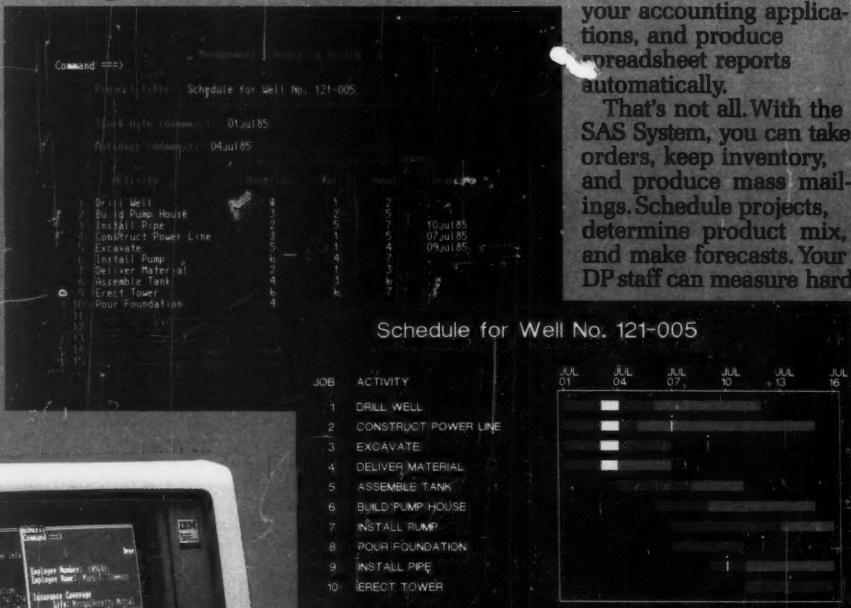
THE SAS[®]

Fourth Generation Software

**Now there's one software solution
for all your Information Center
needs. One solution for all your ap-
plications, for all your mainframes,
minicomputers, and microcomputers.
One solution—the SAS® System.**

One Solution to Integrate All Your Computing Tasks.

The SAS System gives you efficient data management, superior statistical tools, an easy report generator, customized presentation graphics, and more. Choose between the simple English-like command language or a front-end menuing system with



SYSTEM

for Your Information Center.

ware resources or system usage, test data bases, and run production programs.

One Solution that's Friendly.

It's simple with the SAS System. You can write front-ends for all your SAS applications. With just a few keystrokes, you can modify the applications as your information needs change. One language handles all your tasks. And if you need to move between several operating systems, you'll find the language, syntax, and commands the same for the mainframe, minicomputer, and PC SAS System.

One Solution with Full Support.

Training is easy too. We offer instructor-based, video-based, and

computer-based training. Technical support is provided for our mainframe, minicomputer, and microcomputer users, and documentation comes with your system.

```
DATA CLASS1  
INFILE STUDENT;  
INPUT NAME $1-6 AGE 10-11 IDNUMBER 135  
PROT MEAN DATA=CLASS MEAN;  
VAR AGE1;  
RUN;
```



Announcing Version 5

Call us today.
International customers,
call the International
Marketing Department
for information on your
local distributor.

Whatever your
application, the
SAS System
is your solution.

SAS

SAS Institute Inc.
SAS Circle, Box 8000
Cary, North Carolina
27511-8000, USA.

(919) 467-8000, x280
Telex 802505

Investment Hot Spots

U.S. companies invested \$226.1 billion in foreign operations in 1983. The largest investment dollars were attracted to these areas:



The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCP; on Digital Equipment Corp. VAX™ 8600 and 11/7xx series under VMS™; on Prime Computer, Inc. Prime 50 series under PRIMOS™; on Data General Corp. ECLIPSE™ MV series under AOS/VS; on IBM XT/370 and AT/370 under VM/PC; and on IBM PC XT and PC AT under PC DOS. Not all products are available on all operating systems.

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. VAX and VMS are trademarks of Digital Equipment Corp., Maynard, MA. PRIMOS is the registered trademark of Prime Computer, Inc., Natick, MA. ECLIPSE is the registered trademark of Data General Corp., Westboro, MA.

Copyright © 1985 by SAS Institute Inc. Printed in the USA.

COMMUNICATIONS

Choice: T1 or channel bank?

From page 23

dle analog voice transmissions, while T1 muxes primarily handle digital data transmissions.

Because a channel bank's standard input rate is 64K bit/sec., it typically cannot divide a T1 channel into more than 24 subchannels.

In contrast, a T1 mux can subdivide a T1 channel into 96 9.6K bit/sec. circuits or even 200 low-speed data channels supporting 4.8K bit/sec. or even 2.4K bit/sec. substrates.

It also accepts superrates — generally up to 768K bit/sec. for compressed video transmission. Some vendors refer to this as dynamic bandwidth allocation.

T1 muxes are also more flexible in their management of available bandwidth, of-

ten allowing for software-based reconfiguring of channel allocation.

Channel bank limitations

Channel banks have limited data-carrying capabilities. They can, with difficulty, handle 9.6K bit/sec. rates transmitted by the appropriate modem, but cannot directly handle data rates at 56K bit/sec. or 64K bit/sec., except via a Dataphone Digital Service connection.

Linking a digital commu-

nications device such as an IBM 3725 front-end processor to a channel bank is arduous at best. First the transmission must be converted from digital to analog by a modem. Then the channel bank converts it again to a different digital stream, to be placed on a T1 line. The reverse process takes place at the receiving end.

The fact that a channel bank cannot divide a T1 link into more than 24 subchannels can also result in inefficiencies.

cient handling of multiple data circuits. It would take eight channel bank termination devices (four on each end of the link) and four T1 lines to transmit 96 9.6K bit/sec. data streams from point A to point B. Each T1 line would carry 24 channels, each capable of transmitting 64K bit/sec. but actually carrying only 9.6K bit/sec.

In contrast, it would only take two T1 muxes and one T1 link subdivided into 96 fully utilized channels to carry the same 96 9.6K bit/sec. data streams.

On the other hand, channel banks are more suitable than T1 links at moving voice calls — for example, tie lines between PBXs. Designers of T1 mux equipment are starting to include voice cards that handle 32K bit/sec. voice transmission. The quality is acceptable but not always standard-toll quality. Among the vendors that provide such products are Timeplex, Inc., Aydin Corp., Datatel, Inc. and Coastcom.

Protocol criterion

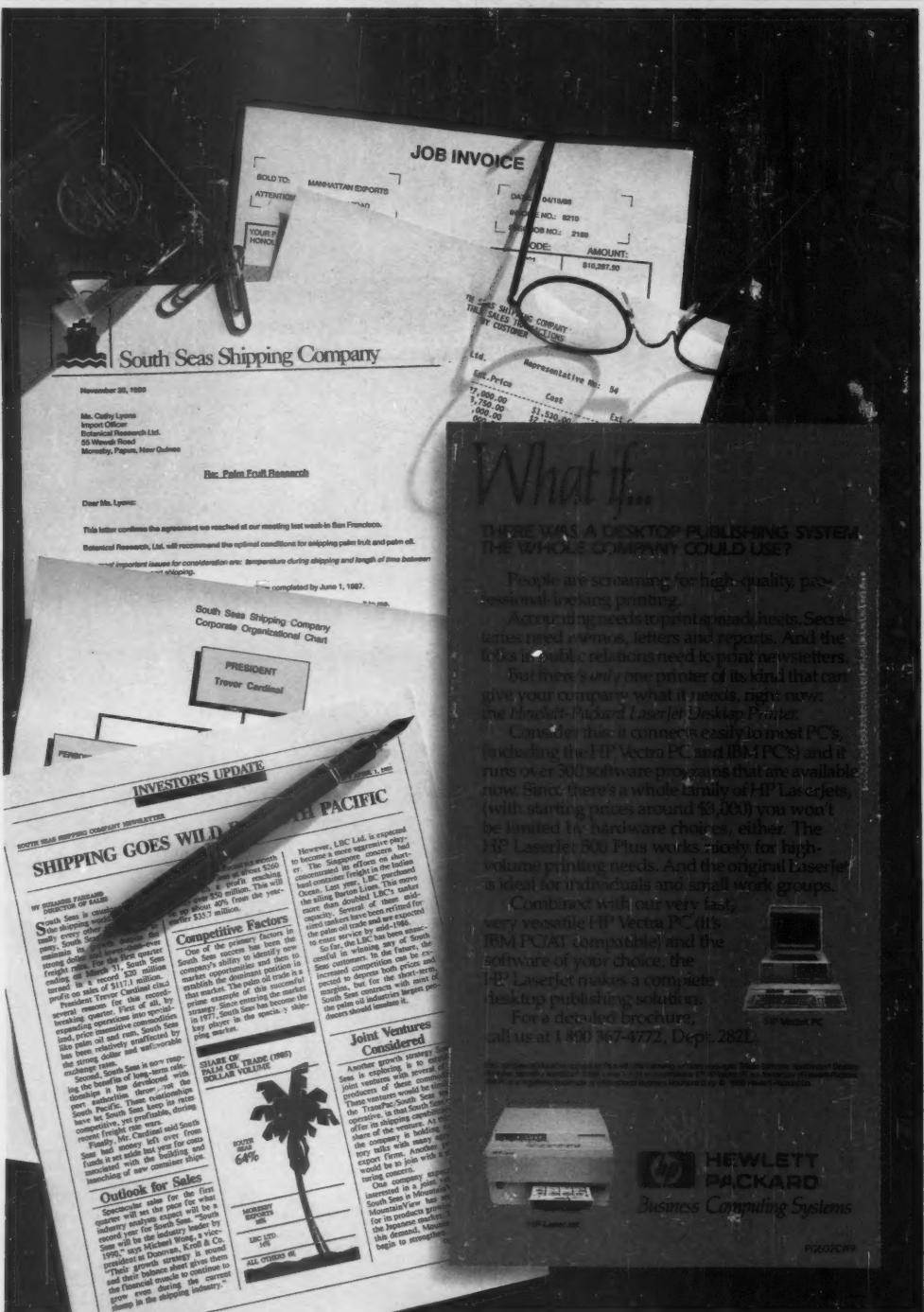
Another important advantage in T1 equipment is the integration of data and voice channels on the same T1 link. An important criterion, however, is whether the vendor uses D4 byte-interleaving protocols that are compatible with AT&T Communications' Digital Access and Cross-Connect System (DACS) and Customer Controlled Reconfiguration. These protocols enable customers to switch individual 64K bit/sec. channels from one T1 channel to another.

Some vendors use their own proprietary signaling protocols, thus preventing customers from linking their T1 networks with networks based on other vendors' T1 equipment. Other vendors use bit-interleaving protocols that allow for additional capabilities — such as supporting 200 or more channels on one T1 link — but are not compatible with DACS.

Customers who use this type of system will not be able to terminate their DS1 channels at local or long-distance carriers' central offices.

Telecommunications managers shopping for T1 equipment should keep all of the above considerations in mind. They should also think about the future, when carriers have successfully adopted Integrated Services Digital Network standards.

Some T1 vendors claim that their equipment will easily migrate to the new standard. Prospective customers should ask for details on what this will really mean to their companies: an inexpensive upgrade, a massive overhaul or replacing their current T1 equipment, which is an expensive and painful process.



SYSTEMS & PERIPHERALS



HARD TALK

James Connolly

Early delivery is simple math

It should not have been surprising that IBM advanced the delivery schedule for the latest star of its large systems product line, the four-processor 3090 Model 400.

After all, the Model 400 is essentially a merger of two 3090 Model 200s. IBM left itself plenty of leeway in setting the delivery schedule, originally allowing 26 months to ship the quadratic version when the dual-processor Model 200 was due for delivery in only nine months. That gave IBM almost a year and a half to merge the hardware and software of two dual-processor boxes. So the original second-quarter 1987 delivery date was changed in February to fourth-quarter 1986.

To the delight of some customers who were desperate for power, the new date quietly was shifted, and the Model 400s left IBM in August.

One has to wonder, however, if the schedule advances are, as IBM says, the result of Model 400 development progressing faster than expected or even, as IBM would like users to think, if the company wanted to give loyal customers as much power as possible. A skeptic might wonder whether the early shipments were related to National Advanced Systems Corp. and Amdahl Corp. recently installing their 3090 rivals.

But it is more likely that Model 400 deliveries beginning in August are the result of that month's falling during the third quarter of IBM's 1986 fiscal calendar. It is unfortunate — although

See EARLY page 30

Connolly is Computerworld's senior editor, systems & peripherals.

HP mini boasts power gain

Mid-range 3000 Series 52 provides upgrade path for Series 42 customers

By James Connolly

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a mid-range business system designed to provide a 30% performance boost and four times more memory than its earlier HP 3000 Series 42 minicomputer.

The new HP 3000 Series 52 reportedly uses the same processor as HP's next, more powerful machine, the HP 3000 Series 58, rather than the reduced instruction set computing-based architecture of the high-end HP 3000 family of machines introduced earlier this year.

According to Douglas C. Spreng, general manager of HP's Computer Systems Division, the Series 52 supports up to 92 personal computer users or terminal users while running HP's Personal Productivity Center and Advancenet software.

"The new system is a cost-efficient alternative for companies that would like improved performance for their applications. These companies need to know that a growth path exists, even though they may not currently need support for more than 100 users that the larger Series 58 provides," Spreng said.

The Series 52 reportedly can work as a node in a distributed data processing network or in a stand-alone business environment.

The system is said to support 4M to 8M bytes of memory and a 32K-byte cache memory. It runs HP's MPE operating system and Turboimage data base management system and was designed to be compatible with all other members of the HP 3000 family.

Among the peripherals that are supported are eight disk drives ranging from 28B bytes to 404M bytes for a maximum of 3.2G bytes, four tape drives and four line printers or eight serial printers.

An HP 3000 Series 52 with 4M bytes of memory, two I/O channels and operating system costs \$45,000.

INSIDE

HP workstation bows at Siggraph conference/30

National Archives urged not to store records on optical disks/31

NEW THIS WEEK

■ Talaris Systems combines alphanumeric and graphics on 7800 terminal

■ Kentek Information Systems offers 12 page/min. printer

■ For more on these and other new products, see pp. 73-88.

INSTANT ANALYSIS

"By this time next year, DEC could release a quad-processor, 20-MIPS machine. If IBM were to release a 20-MIPS System/38, it would be competing against its own 3090s."

— Marc Schulman, analyst and vice-president, Salomon Brothers, Inc., speaking at an August briefing session on Digital Equipment Corp.

Micro, Unix markets top shortcomings DEC must face in future, analysts say

By Donna Raimondi

NEW YORK — Although it has been out-pacing the rest of the computer industry in sales, Digital Equipment Corp. faces substantial obstacles it must overcome, analysts said at a recent conference.

DEC's so-called hidden assets — sophisticated users who have helped produce an extensive software library — are no longer the company's prime customers, according to analysts who spoke to 325 attendees at a briefing in New York last week sponsored by the Boston-based Yankee Group. The technically oriented customer base, which helped to propel the minicomputer vendor to prominence as the world's second largest computer company, has been expanded to include customers who rely on vendor-developed software.

Market conditions have changed since

DEC's early days. The minicomputer market is mature, hardware is almost a commodity market and many of the customers DEC needs to serve are not its traditional technical users, the analysts said.

"The real growth is in workstations now, where DEC has failed," said Howard Anderson, managing director of the Yankee Group. "The microcomputer business is \$8 billion — larger than DEC — and Ken Olsen takes the blame for DEC's weakness here." According to Anderson, current advantages in networking and clustering concepts are temporary, with other vendors poised to catch up in the next year or so.

Part of DEC's strategy for the next few years includes introducing more versions of its successful Microvax II system.

See DEC page 31

AWARD WINNER
\$25 MILLENNIUM AWARD

There Are 48 Reasons Why You Should Have EPIC/VSE.

Here are 3 of them.

1. EPIC/VSE supported IBM's DOS/VSE SP2.1 the same day IBM announced it.
2. EPIC/VSE is SVA resident and fully re-entrant—gaining control only when there's work to be done.
3. EPIC/VSE requires exactly zero K for System GETVIS storage. (Another "leading" system gobbles up 400K or more.)

Tired of evaluating "me too" disk and tape managers? Take a good look at EPIC/VSE—the "me first" Resource Management System. A Tower Systems' representative will show you an Evaluation Workbook. With it, you can learn why EPIC/VSE defines Resource Management. And you can make easy, direct comparisons, feature by feature, between EPIC/VSE and conventional disk and tape managers. You have exactly four dozen reasons to call Tower Systems now.

EPIC/VSE. The First. The Best.
1-800-854-7551. In California: 714-650-4900
2220 Fairview Road Costa Mesa, CA 92627

TOWER SYSTEMS INTERNATIONAL

SYSTEMS & PERIPHERALS

HP, others unveil engineering workstations at Siggraph

Model 320SRX offers faster image modeling

By Rosemary Hamilton

DALLAS — A number of new models and performance boosts were introduced by engineering workstation vendors at the annual Siggraph trade show and conference held in Dallas recently.

Hewlett-Packard Co. unveiled an addition to its 9000 line of technical workstations. The Model 320SRX, designed for solids modeling, has a starting price of \$45,800.

Based on custom very large-scale integration chips, the 320SRX incorporates graphics instructions into the microcode and hardware, thus allowing for solid images to be rendered at a speed 20 to 30 times faster than that of other workstations in a similar price range, according to the vendor.

The system, which is expected to ship within two months of order, comes with 4M bytes of main memory; an I/O expander; the HP high-speed Interface Bus and LAN; the HP-UX operating system with a graphics library, a 1,280- by 1,024-pixel resolution monitor, eight planes of frame-buffer memory and four overlay planes.

The 320SRX's operating system is based on the AT&T System V version of Unix.

Model upgrades

Upgrades from other 300 models in the 9000 series are available. If a Model 320 user were to add the 320SRX display controller and the

HP-UX operating system with the graphics library, it would cost \$12,440.

A \$10,000 graphics accelerator, a \$1,300 power supply and eight planes of additional memory at a cost of \$4,500 are also available.

Silicon Graphics, Inc. introduced an enhanced proprietary graphics processor, the 10-MHz Geometry Engine, that it claims offers a 25% to 30% performance boost over the current Geometry Engine used in its Series 3000 workstations. The enhanced processor will be offered as a \$5,000 option for new systems or as a \$7,000 upgrade kit to the company's installed base.

The Geometry Engine, which func-

tions as a separate processor from the CPU, reportedly enables the system to manipulate three-dimensional wire-frame and solid models in real time.

The vendor also said it has formed a subsystems group that will sell board- and chip-level products based on its Geometry Engine to OEMs.

Excalibur workstation

Saber Technology Corp. introduced its top-of-the-line Excalibur workstation, the Model 3080, which is based on the National Semiconductor Corp. 32020 microprocessor. The system, with a starting price of \$71,300, will be targeted at graphics-intensive applications such as molec-

ular modeling, medical imaging and seismic analysis.

An entry-level system comes with 4M bytes of main memory, expandable to 12M bytes, an 85M-byte disk drive expandable to 350M bytes and a 19-in. monitor that can display up to 1,096 colors simultaneously.

Japan Computer International, the U.S. subsidiary of the Tokyo-based Japan Computer Corp., announced its G5068 color graphics workstation, which it plans to sell to OEMs. The Motorola, Inc. 68020-based system can be used for either two-dimensional or three-dimensional applications and can be switched to either a 16-bit or a 32-bit mode, according to the vendor. The starting price is \$39,950.

Early delivery is simple math

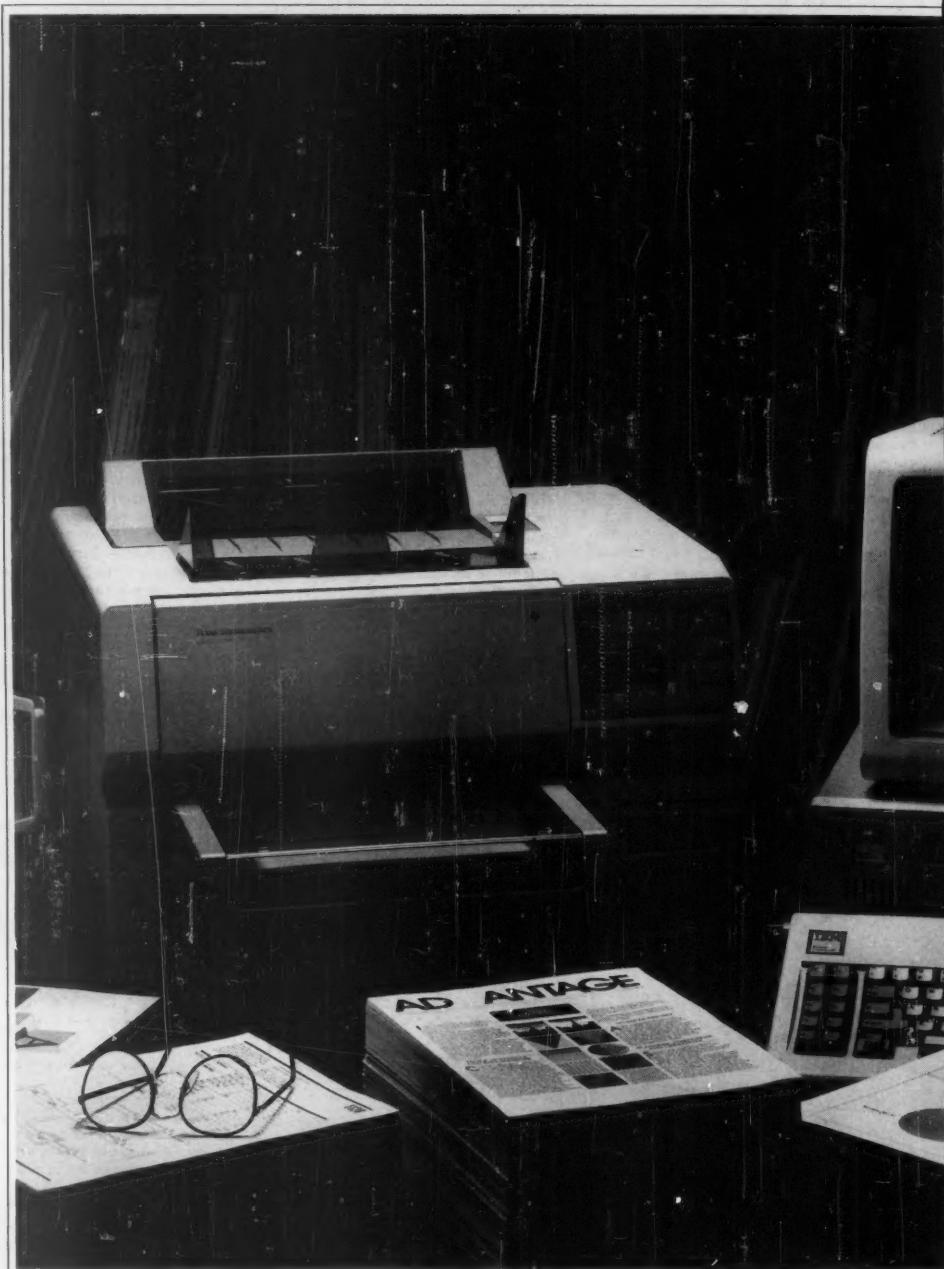
From page 29

surprising to only the most naive — that IBM pretends to have rushed the Model 400 out the door to address its customers' needs.

But in the world of business, the need for revenue can be a legitimate, or at least an arguably legitimate, reason for almost any action. If IBM was not stuck in the doldrums, the Model 400s would have been sitting in IBM's Kingston, N.Y., factory until the flowers bloomed next spring. The Model 400 does mean revenue for IBM, even if the system does not sell as well as expected and even if moving what could have been 1987 sales into the third quarter of 1986 hurts 1987's results.

If IBM can deliver and record as third-quarter sales even a dozen of the roughly \$4 million Model 400 upgrade packages, that translates into \$48 million revenue in simple math, almost \$20 million in profits if one uses less simple math to calculate the profits on a mainframe at 40%, as some IBM analysts have done.

So, once again the almighty buck rules. But at least this time, someone besides IBM — like the users who could not understand the reason for the original 26-month lead time — might profit.



National Archives' storage under scrutiny

Study deems tapes, disks to be unsuitable

By Mitch Betts

WASHINGTON, D.C. — The prestigious National Research Council has issued a report urging the National Archives not to use magnetic media or optical disks to permanently store historical documents.

Optical disks and magnetic media last only 10 to 20 years for archival purposes, and the rapid pace of change in hardware and software technology suggests that it may be impossible to read the historical records in the centuries to come, accord-

ing to the report, "Preservation of Historical Records."

William Holmes, director of the National Archives and Records Administration's archival research and evaluation staff, stated that he agrees with the research report's conclusions.

He said that although the agency plans a pilot test of digital imaging and optical-disk technology [CW, April 14], optical disks will be used only for public retrieval and not for permanent storage.

"Even if the operating systems and documentation problems somehow are dealt with, what is the archivist to do when the machine manufacturer declares the hardware

obsolete or simply goes out of business?" the research report asked. "Will there be an IBM or a Sony in the year 2200? If they still exist, will they maintain a 1980-1990 vintage machine?" the report continued.

An example of this problem occurred in the mid-1970s when archivists discovered that there were only two computers that could read the 1960 U.S. census; one was in the Smithsonian Institution and the other was in Japan [CW, Sept. 23, 1985].

The inescapable conclusion, the researchers said, is that long-term archives would be committed to an expensive file conversion program every 10 to 20 years if it uses electronic media for permanent storage.

DEC must meet mart challenges

From page 29

"There could be a 2.5-million-instructions-per-second Microvax II by fourth-quarter '87," said William Rosenberger, vice-president of communications and information systems at Yankee.

DEC will announce a Microvax clustering capability by fourth-quarter '86, but it will not enable Microvax owners to link up to the main Vaxcluster, Rosenberger said. DEC appears to be working on a quattro-processor, 20-MIPS machine based on its current VAX 8800, which could be available in nine to 12 months, Rosenberger added.

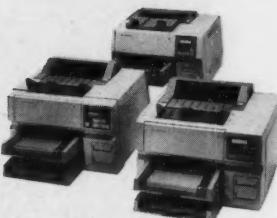
Right now, DEC is benefiting from a fallout in the industry, Anderson said. Its major competitors — Data General Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. — have squandered early advantages. But

“

'It requires at least two people to support any one operating system, so we like that VMS runs on all the VAXes.'

— Steven Gokorsch,
General Electric Co.'s
Lighting Business Group

TI's new OmniLaser™ page printer can turn your PC into a desktop publishing system.



Combined with the right software, you can now have a publishing house right on your desk top. If you have a personal computer, you are ready to get started. TI's OmniLaser with any IBM®-compatible, Macintosh™, or virtually any PC, and the right software, can help you eliminate costly typesetting, outside design work and printing. At 300-dots-per-inch resolution, the difference between laser printing and daisy wheel or dot matrix is more than mere improvement. It's light years ahead.

The OmniLaser Series 2000 family from Texas Instruments is available in three desktop models designed to address workstation and shared-resource environments at 8 and 15 pages per minute, respectively. Both the 2108 and 2115 feature the

PostScript® page-description language, which allows full integration of text, graphics and scanned images on a single page. Your business communications will be more eye-appealing and carry more credibility. And the Model 2015 was designed to handle text and business graphics in a shared-resource environment. All three OmniLasers, with their standard interfaces and emulators, allow you to take full advantage of your present business computer applications, as well. And they'll give you unparalleled resolution in both text and graphics. Blacks are black, whites are white, and you control the shades of gray.

Overall, TI's second-generation laser printers offer up to 10 times the duty cycle, 15 times the machine life and 5 times the paper capacity offered on their first-generation counterparts. These advances, coupled with lower maintenance cost and user-replaceable consumables, significantly reduce the costs of ownership. In fact, at pennies per page, the OmniLaser's per-page cost is among the lowest in the industry.

TI OmniLasers and the power of PostScript.

PostScript is the page-description language that drives OmniLaser Model 2108 and 2115 printers to their full

capabilities, including rotated type, textures, patterns, halftones, images in any size and shape, and a wide variety of typefaces. Each font has one definition that is used as the basis for any point size. You have complete control over the size and positioning of your text and graphics. PostScript also has built-in commands for point specification, circular arcs, curves, etc. You can perfect your text and graphics on your OmniLaser and PC, and then take your original to a high-quality production facility and skip all the headaches of mechanical assembly.

Whether you're composing newsletters, product data bulletins, ad proofs, business presentations, technical manuals, or any type of document, you'll find that with the power of PostScript, you are only limited by your imagination.

OmniLasers. They bring power, flexibility and affordability to the world of desktop publishing.

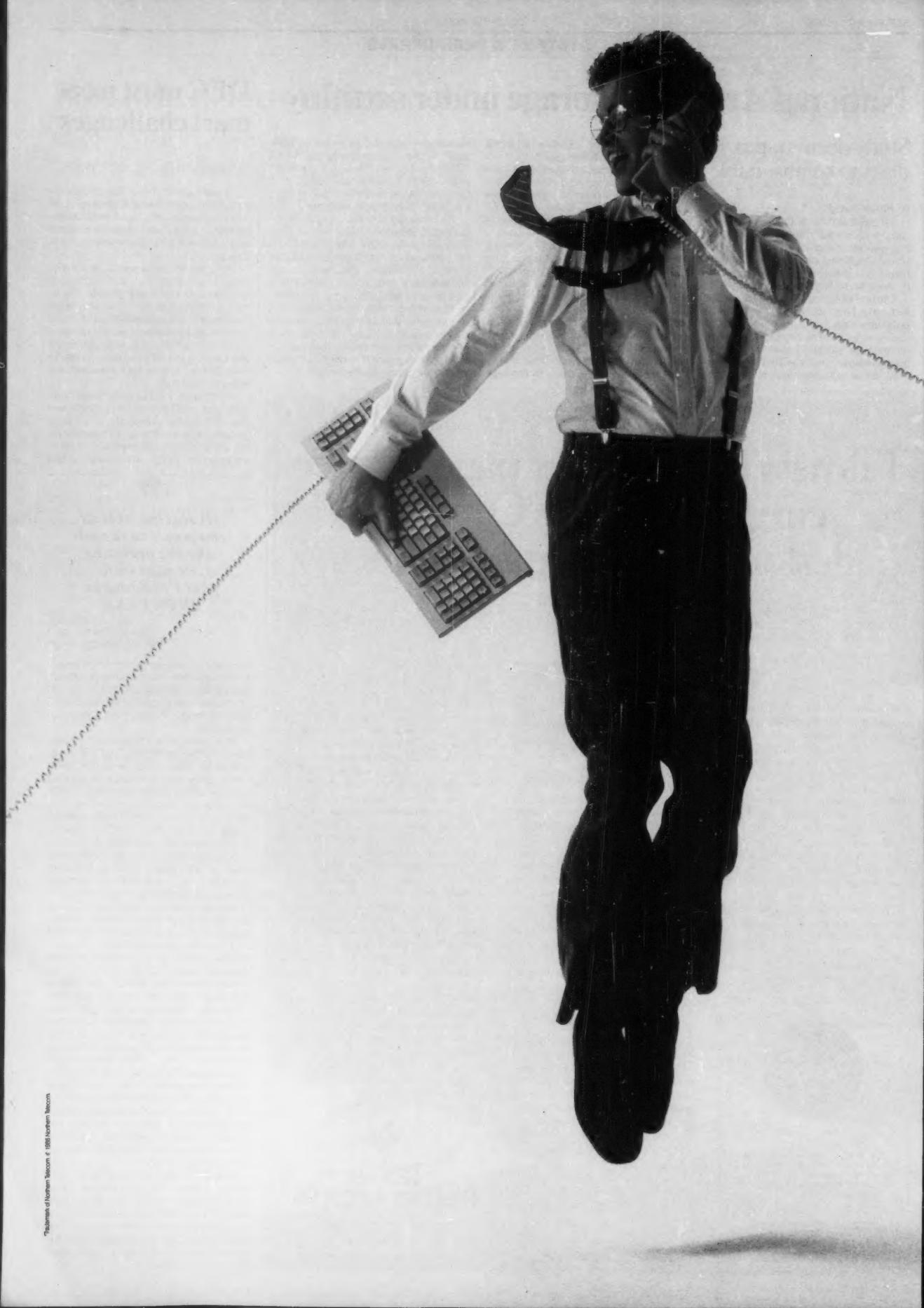
Turn your desk top into a publishing house. For more information on the new OmniLaser 2000 Series page printers from Texas Instruments, call toll-free 1-800-527-3500.



**TEXAS
INSTRUMENTS**



The OmniLaser uses the direct positive-imaging exposure process as opposed to the reverse-imaging process used by many other laser printers. The difference, as shown above, is obvious.



*Trademark of Northern Telecom. © 1989 Northern Telecom

Release the energy of networking for your business. Meridian* services will let you share voice, data, text, and image as simply as you use a phone. Networking your information management tools into one cost-efficient resource gives you a competitive advantage. Ask for Meridian services, provided through Northern Telecom products. Available from phone companies and other suppliers of communication systems.



meridian

NETWORKING

INGRES: The First Distributed Relational Database Solution that Supports ADA.

With INGRES, you get transparent access to all your data. Even if that data is located on different computers. In different locations. And now you can develop ADA applications with INGRES's SQL, forms control and application development tools.

THE DISTRIBUTED DATABASE.

With INGRES, you get a truly distributed database. Not just a networked system. Because INGRES is the one RDBMS that works across multiple operating environments. From mainframes to minis to micros. Whether you have a few computers or a few thousand. Which means no matter how large your organization, your data and your applications can be shared. You'll have one consistent relational view of all your data.

The key to your distributed database is INGRES/STAR. Its open architecture gives you universal access to data (supporting multiple vendors' hardware, software and networks), while preserving local control of data integrity and security. Users don't have to worry about where the data is located, how to get it or what type of hardware and operating system are used.

Which means you can build applications (including ADA applications) and share data that span multiple computers just as easily as if all the data were located on one machine. Your entire company uses one powerful DBMS with consistent, reliable results.

INTEGRATED APPLICATION TOOLS.

Only INGRES gives you a comprehensive application development environment. With a 4GL that includes SQL, a Visual Forms Editor and host language interfaces (BASIC, C, COBOL, FORTRAN, PASCAL and PL/I). The newest of which is ADA.

With ESQL/ADA, INGRES gives you access to ADA procedures within the context of a 4GL application. Plus, your programs already written in ADA can access information in an existing INGRES database easily. So you'll work in an integrated environment that gives you

unprecedented productivity in application development.

Your end-users will find it easy to create forms, queries, reports and graphs, too. Because INGRES's Visual Programming tools give them the decision support capabilities they need. While reducing the MIS application backlog.

HIGH-PERFORMANCE SQL AND MORE.

INGRES's SQL is broadly compatible with IBM's DB2. So you can stay with the industry standard. And move applications easily and quickly, whenever you want.

You can also count on higher performance. INGRES is uncommonly fast. And provides special support for transaction processing and complex queries. What's more, INGRES gives you the high levels of data security, integrity and consistency you demand.

So look into the only truly distributed relational DBMS solution. The first to provide an ADA language interface. INGRES. You'll see how the INGRES advantage is the key to integrating your dissimilar computers. For more information, call toll-free:

(800) 4-INGRES

**Visit us at FCC
Booth #126**

Relational Technology

1080 Marina Village Parkway, Alameda, CA 94501

© 1986 Relational Technology

INGRES/STAR, ESQL/ADA and Visual Programming are trademarks of Relational Technology. ADA is a registered trademark of the U.S. Government (Joint Program Office). IBM and DB2 are registered trademarks of International Business Machines Corporation.

INGRES. The Distributed SQL Relational DBMS.

MICROCOMPUTERS



MICRO BITS
William Zachmann

Hardcard is not so hard

I don't know about you, but I still get nervous any time I unscrew the cover on my personal computer to try out new hardware. There are just so many things that can go wrong. The new accessory board may turn out to want an interrupt already in use. One of the ribbon cables climbing over the boards may get pinched when I put the case back on, causing it to short out. I might drop a screw and then scratch a connection on the system board when clumsily fishing it out with a screwdriver.

Nothing terrifies me more, however, than installing a new hard disk. The potential for error or failure, the complications and the dangers are just too numerous. It's not just the physical business of getting the thing in right, either. Sorting out the software has also been quite a task in the past. Being a veteran of a number of hard disk installations, I am always prepared for the worst.

All of this made my experience with the Plus Hardcard 20 by Plus Development Corp. that much more of a pleasure. A crystal-clear "Installation and Reference Manual" combined with an extremely simple and straightforward installation procedure made the difficulties I encountered with hard disks in the past seem like distant memories.

In the first place, the Plus Hardcard 20 is a very elegantly designed 20M-byte Winchester disk and controller mounted on a card that fits into any standard IBM Personal Computer or

See **HARDCARD** page 36

Zachmann is vice-president of research at International Data Corp.

Sperry micros enhanced with printer, high-resolution graphics

Laser printer targets office environment

BLUE BELL, Pa. — Sperry Corp. recently announced enhancements for its Personal Computer/IT and PC/HT systems, including a 10-page/min. laser printer, a high-resolution controller, an enhanced color graphics monitor, two high-capacity fixed disk drives and a terminal emulation security option.

According to Sperry, the Model 37 laser printer's speed, compact size, flexibility and quiet operation make the machine a good choice for both multiuser and single-user office environments.

The \$3,500 printer reportedly works with almost any software

package. The unit emulates the Sperry Model 31, the Epson America Corp. FX-80, the IBM Personal Computer Graphics Printer, Qume Corp.'s Sprint 11, Hewlett-Packard Co.'s LaserJet, the Diablo Systems, Inc. 630 and NEC Corp.'s Spinwriter 3550 printers.

Stores up to 61 fonts

Offering 300- by 300-pixel resolution, the Model 37 stores as many as 61 fonts in read-only memory and includes 1M byte of random-access memory as well as support of multiple character sets.

Citing an industry movement toward high-resolution graphics for scientific and engineering applications, Sperry introduced the controller and monitor with support for IBM's Enhanced Graphics Adapter

(EGA) standard.

In addition to EGA compatibility, Sperry's Enhanced Graphics Controller also provides IBM Color Graphics Adapter compatibility and monochrome display ability.

Controller resolution

Priced at \$524, the controller supports 640- by 350-pixel resolution in both color and monochrome and 720- by 348-pixel monochrome resolution when emulating the Hercules Computer Technology, Inc. Graphic Card. The controller includes a 256K-byte display buffer.

The 14-in., dual-pitch Enhanced Graphics Monitor displays 16 of 64 possible colors in 640- by 350-pixel resolution. The monitor is priced at \$849.

Designed specifically for the Sperry PC/IT, the two full-height, 5½-in. drives feature formatted capacities of 69M bytes and 117M bytes. Average access time for both drives is 30 msec.

A PC/IT system can now be configured with any two of the three available drives — including a 40M-byte model — for a maximum capacity of 234M bytes. The 69M-byte drive is priced at \$2,650; the 117M-byte drive lists for \$5,495.

Sperry also announced a security feature for its Step terminal emulation package for connecting the company's personal computers to its Series 1100 mainframes. A \$500 expansion card provides a connector containing preset user identification codes.

All of these products are available now.

Bad chip hampers AT clone

Televideo resolves error, but too late for one user

By David Bright

An improper chip in approximately 200 Televideo Systems, Inc. IBM Personal Computer AT compatibles has caused intermittent problems for some users and a major headache for at least one user, *Computerworld* has learned. According to Televideo, most of the Telecat-286 systems containing the bad chip have been tracked down and repaired.

The \$2,995 Telecat-286 was introduced in late April. During the following two months, more than 5,000 of the systems were shipped, said Ron Nakashima, director of systems product marketing.

According to Nakashima, the motherboards on as many as 200 of the early Telecat-286 systems had been outfitted with the wrong version of a memory chip mistakenly supplied by Motorola, Inc.

The CMOS static random-access memory (RAM) chip contains system setup information, such as the type of hard disk drive and the number of disk drives. In certain cases, Nakashima said, that information was lost, leaving the systems unable to be booted from the hard disk drives. He said the problem can be corrected simply by replacing the offending chip with an upgraded version.

An undetermined number of the upgrades were made in Televideo's warehouse before the systems were shipped, according to Nakashima. As for the rest of the defective systems that might have been shipped, Nakashima said distributors would be aware of the potential problem for as long as a month, but he was unsure exactly how many upgrades had been made so far.

"It's not a massive failure type of thing," Nakashima stressed. "The system is still viable. It just becomes inconvenient that the initial setup information is lost. You can also always revert back to the system boot diskette."

Nakashima claimed that most of the reported problems concerning the bad chip occurred when users failed to turn on the battery switch, which holds information in the CMOS RAM chip when the system is brought down.

"It's one of those intermittent things. That's why, when we first released the product, we had difficulty in finding out what the problem was or whether there actually was a problem," he said.

One early user who was acutely aware of a problem was Cynthia Lettich, DPM manager at Hughes Lumber Co. in Tulsa, Okla. After reading favorable reviews about the system's price/performance ratio, Lettich purchased a Telecat-286 June 27 for about \$2,000 less than the cost of a comparably

See **CHIP** page 38

INSIDE

Santa Clara Systems announces mass storage, RAM disk system/38

NEW THIS WEEK

- NEC America offers software for its voice recognition plug-in board for PCs

■ For more on this and other new products, see pp. 73-88.

INSTANT ANALYSIS

"Say we come out with a new DOS. It's not like everybody is going to go out and buy it overnight."

— Bill Gates,
chairman of
Microsoft Corp.

Easylan tool transfers data direct from 5½- to 3½-in. floppy disks

SUNNYVALE, Calif. — Server Technology, Inc. recently announced a utility to its Easylan local-area network (LAN) software that allows direct data transfer of files between 5½-in. and 3½-in. floppy disk drives, such as those used in IBM's PC Convertible laptop microcomputer.

The utility eliminates the necessity of adding a 3½-in. floppy disk drive to the LAN in order to allow users of systems that use the smaller disks to exchange files

or share printers or other peripherals. The user also does not need to convert file formats.

Easylan will support up to 18 IBM Personal Computers or compatibles, Personal Computer XT's, AT's or PCjr systems.

This latest version of Easylan is available immediately in a starter kit that includes a 3½-in. program disk, a manual and a 30-ft. modem cable for \$189.95.

Current users may upgrade for \$119.95.

MICROCOMPUTERS

Hardcard is not so hard

From page 35

compatible long expansion slot. It is engineered very well, using an ultra-thin 3½-in. Winchester drive that actually lets it fit next to another long card. Most card-mounted hard disks are wider and overlap into the space of an adjacent expansion slot.

Physical installation is a snap. There is one jumper on the card that must be set either to a "PC" or an "XT" position. This sets the BIOS address, port address and controller number used in the computer interface to that of an IBM PC or Personal Computer XT. Then you simply slide it into any long slot and put the

cover back on. Running a very simple Install program then gets you up and running. I can't imagine a hard-disk installation being simpler or easier.

A Hardcard Directory program comes with the Plus Hardcard 20. It lets you select programs from a menu instead of from the DOS prompt if you wish and includes a screen-saver feature. That turns the display off after five minutes to save the screen phosphor. It turns back on again with the first keystroke.

A small manual entitled, "Installing Application Software onto Hardcard" provides a step-by-step guide to installing popular products such as Dbase III by Ashton-Tate and Lotus Development Corp.'s 1-2-3 on the Plus Hardcard 20 so as to use the Hardcard Directory. If you don't use the Hardcard Directory, of course, standard installation procedures are

all that are required.

Unlike some of the earlier hard-disk add-ons for the IBM PC, the Plus Hardcard 20 makes it possible to boot from the hard disk. It does not run, however, with the earliest version of the IBM PC BIOS with read-only memory, so older systems (generally prior to 1983) may require a BIOS upgrade for use with the Plus Hardcard 20.

Additional software includes Light and Sound. These optionally display a "+" character on the upper right corner of your screen or make a sound when the Plus Hardcard 20 is accessed. They provide a functional equivalent of the LED that lights up on a front-mounted hard disk when it is accessed.

My own preference is actually to skip the software that comes with the Plus Hardcard 20, format it with

a standard Microsoft Corp. MS-DOS FORMAT /S /V command and go. That works fine on standard, fully compatible systems.

Another program provided by Plus, HFORMAT.COM, is set up by the Install program on systems with versions of DOS where the FORMAT command requires special patching to work with the Plus Hardcard 20.

More than just being easy to install and use, however, the Plus Hardcard 20 is also fast. With an average access time of 49 msec., it is a lot faster than the old IBM XT drives and nearly as fast as the 20M-byte Winchester on the IBM PC AT. Programs that require a lot of disk access — data base management systems, for example — will run significantly faster than on older hard disks, which typically have average access times in the range of 65 to 85 msec.

Another very nice aspect of the Plus Hardcard 20 is a patented feature that automatically retracts the read/write head to a landing zone

"

Another very nice aspect is a patented feature that automatically retracts the read/write head to a landing zone and locks it in place when the system is powered down.

and locks it in place when the system is powered down. This minimizes the chance for vibration damage and loss of data if the system is moved.

On many hard disks, this needs to be done explicitly with a utility program for that purpose. This feature makes the Plus Hardcard 20 especially useful on portable systems.

The Plus Hardcard 20 is explicitly stated to work with the IBM PC, IBM PC XT and IBM 3270 Personal Computer; the Compaq Portable and Deskpro from Compaq Computer Corp.; the AT&T Personal Computer 6300 (dual-floppy and 10M-byte versions only); and the Olivetti Corp. PC M24 (dual-floppy and 10M-byte versions only). It will also work with a number of other compatible systems.

The Plus Hardcard 20 carries a suggested list price of \$895. An older product, the Hardeard 10, pioneered the hard disk on a card and carries a suggested price tag of \$695 with a 10M-byte, 65-msec. drive.

Both offer a very good way to get more value out of older floppy disk systems.

CORRECTIONS

Xerox makes these publishing tools obsolete.

Production Publisher Solutions



Design
Pagination
Terminal



Editing
Terminal



XPS 700
Publishing System



3700 Laser
Printing System



4050 Laser
Printing System

You can stop cutting and pasting. And stop sending in-house technical publications, catalogs, and reports to outside production houses.

Because now there's Production Publisher Solutions from Xerox, an array of hardware and software that enables you to produce documents faster and easier. With a quality that rivals outside print shops.

For example, you can access powerful composition software to compose, edit, and revise your documents electronically, so even last minute revisions won't slow you down. And the Design Pagination Terminal lets you design the look of an entire document, and actually merge text and graphics, including signatures, without using a sheet of paper.

The entire process is controlled by the Xerox Publishing System 700, one of the industry's most powerful integrated composition software. And it is made even more powerful through its use of the Interpress document and page description language. Not only will the XPS 700 manage all elements of the production process, it can be connected to a wide range of computers, printers, and other input and distribution systems you may already own.

The Xerox 4045 Laser CP and the 2700, 3700, 4050, 8700, or 9700 Laser

Printing Systems give you truly superior documents in more than 500 fonts. With job-programmable computers built right in, and almost countless capacity for workloads, they will send your current in-house publishing capabilities into obsolescence.

But the Xerox Production Publisher Solutions are much more than electronic breakthroughs. They include the advice, service and support of the people of Team Xerox. In fact, Team Xerox will examine your office documents, and recommend precisely which office machines will make your work easier.

Call us at 1-800-TEAM-XRX, ext. 110. Our solutions just might be yours.

Team Xerox

Xerox Corporation, P.O. Box 24, Rochester, NY 14692
I'm interested in learning more about Production Publisher solutions.

Please have a sales representative contact me.

Please send me more information.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

Or, if you can't wait, call
1-800-TEAM-XRX, ext. 110
(1-800-832-6979, ext. 110)

10 013-91-86

The UNIX Operating System. It is an option no business professional can afford to ignore.

UNIX is a multi-user, multi-tasking operating system which provides you with a unique and innovative menu of business solutions, with unparalleled versatility, portability and affordability. You can experience the best UNIX has to offer at UNIX EXPO.

At UNIX EXPO, you can discuss your business requirements with the leading manufacturers and suppliers of UNIX solutions while they demonstrate and describe how the UNIX Operating System will meet the needs of your organization. Interact with the leading professionals at the Conference and come away with a full understanding of UNIX solutions and applications. At the AT&T Tutorials and Computer Labs both new and sophisticated UNIX users will acquire the skills to meet today's technical challenges.

The UNIX Operating System Exposition & Conference

UNIX EXPO

Plan now to attend and profit from
the proven UNIX marketplace.

October 20, 21, 22, 1986
Jacob K. Javits Convention Center,
New York City

For all the details on attending or exhibiting contact:
National Expositions Co., Inc. 49 West 38th Street Suite 12A
New York, NY 10018

UNIX™ is a registered trademark of Bell Labs. UNIX EXPO is not affiliated with Bell Labs.

MICROCOMPUTERS

Mass storage system claims faster access than hard disks

RAM with battery backup aimed at nets

By Peggy Watt

SAN JOSE, Calif. — Santa Clara Systems, Inc. last week announced a mass storage system that acts as a fast-access, random-access memory (RAM) disk with battery backup.

The Batram, which will be sold by both Santa Clara Systems and Novell, Inc., is aimed largely at network use, since it provides faster access times than a hard disk, according to Darrell Evora, Santa Clara Systems' vice-president of marketing. He added that several other OEM agreements

are pending.

The system will also support the Lotus/Intel/Microsoft Expanded Memory Specification (EMS), which provides a kind of memory caching to enable Microsoft Corp. MS-DOS- and IBM PC-DOS-based systems to break the operating system's 640K-byte barrier, Evora said.

Unlike most RAM disks, the product retains data stored in the added memory and includes a rechargeable battery backup for up to two weeks of reserve power. That also enables the unit to be moved; because it is chip-based rather than disk-based, the Batram is sturdier than a hard disk, the firm said.

The Batram — which stands for

Battery Backed-Up RAM — offers from 4M to 80K bytes of RAM storage and is priced starting at \$1,895 for the 4M-byte version.

Each additional 4M-byte memory card, with CMOS RAM chips, is priced at \$1,295.

Units are available now, and Santa Clara Systems promises a version with high-density 1M-byte RAMs by early next year. "The chip-to-disk communication is the biggest bottleneck" in retrieving data on a network, according to Evora. "The server can't transfer data as fast as the CPU wants to get it."

Speed of the Batram disk is limited only by the speed of the processor, Evora added. Systems based on the

Intel Corp. 80386 chip "will make it fly," he said.

Evora said the Batram is also aimed at some disk-intensive single-user applications, such as computer-aided design and manufacturing or desktop publishing.

Also available in mid-September is an optional software utility, Failsafe Storage, which automatically duplicates data exchanges with the RAM disk to an attached hard disk providing fault-tolerant storage.

The first version supports Novell's Netware local-area network (LAN).

Evora said Xenix and Unix support will be available soon, as well as support for other major LAN configurations.

Chip hampers PC AT clone

From page 35

equipped IBM AT.

But Lettich continually had difficulty booting the system. While the accounting applications backlog for the 10-store retail chain piled up, Televideo over the next month and a half replaced the motherboard twice and the entire system twice — all to no avail.

'Multiple problems'

Televideo technical support manager Nor Rehman claimed that Lettich's system had a "multiple problem" with the CMOS RAM chips and the dealer-supplied operating system software.

"It was just bad luck," Rehman

“

Unable to boot the latest system from either the hard disk or the original floppy disk, Cynthia Lettich said she had no choice but to get her money back and buy the more expensive IBM AT.

said. The software dealer declined comment.

In late August, unable to boot the latest system from either the hard disk or the original floppy disk, Lettich said she had no choice but to get her money back and buy the more expensive IBM AT.

The IBM machine is working fine, but there is a lot of lost time to make up, Lettich reported.

"We are in critical condition because we waited so long," she said. "People are storming the door with applications."

Despite her difficulties with the Teletac-286 system, Lettich is not soured on clones and holds no grudge against Televideo. If another system is needed, she might even give Televideo another shot.

"No guts, no glory," she said.

EDIT WITH POWER!

First there was ISPF which provided programmers with rapid access to programs and data. Then came File-AID, a sophisticated software tool that magnified the power of ISPF. File-AID allows quick and secure access to data without programming. Consolidating both routine and special utility functions, it processes records of any length, and handles VSAM or any other access method. But you need STILL MORE POWER.

Now it's available with File-AID/EXTENDED EDIT. Major functions include:

1. A Formatted Editor which allows the programmer to display and edit records using COBOL record layouts.
2. A Full Screen Editor capable of editing DASD datasets with any record format or length.

File-AID/EXTENDED EDIT handles all access methods and accommodates any record length. Edit the entire dataset or selected records, based on specific criteria.

A thousand satisfied customers already use File-AID. For more information, call Compuware today.

WE PUT THE POWER IN YOUR HANDS!

32100 Telegraph Road
Birmingham, MI 48010
(313) 540-0400 1-800-521-9353 TELEX: 23-5559
PROGRAMMING SOLUTIONS FROM ESTABLISHED EXPERTS

Finally,
a Peacemaker
in the
Computer Wars.

**Motorola
Introduces
Peaceful
Coexistence.**

Our new family of supermicros can end the incompatibility battles between vendors. Between architectures. Between MIS/DP and the end user. Even between new systems and old.

For example, the new VISION/32 system is uniquely capable of letting you expand or coexist with your current VISION-based Motorola systems easily and painlessly. With no major breaks in operation. And no loss of investment.

The open architecture and open operating system of our new supermicros also allow them to peacefully coexist within most environments, including IBM. And within multi-vendor solutions.

Few other systems, if any, give you as great a number of choices in software and peripherals. And right now, from a variety of manufacturers, there are more than 1500 plug-in boards to interface with the VMEbus for added features and functionality.

And with our networks and communications capabilities, entire departments can coexist. Share information and peripherals. And communicate. With each other.

With other departments. Even with the headquarters mainframe.

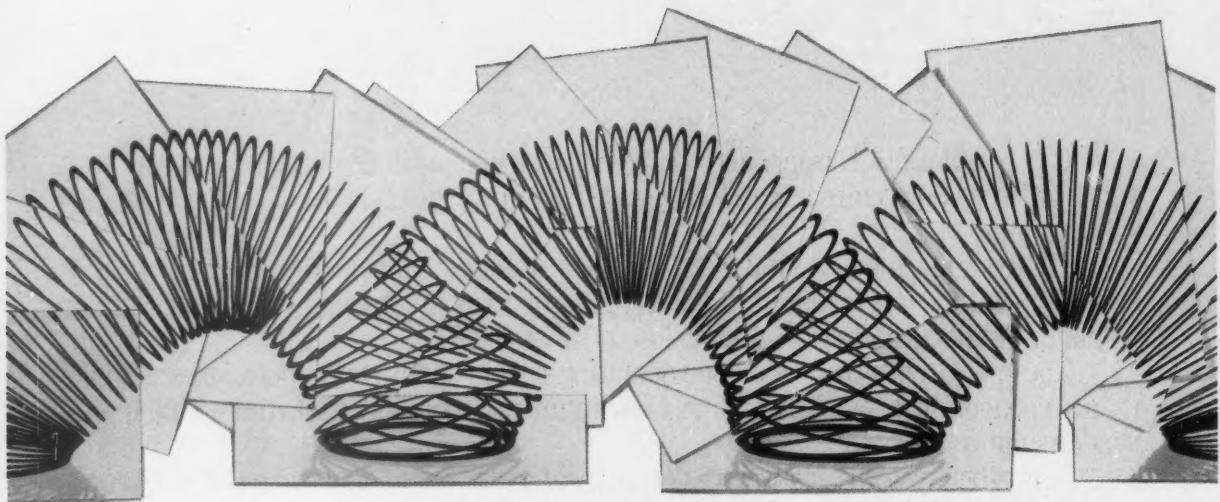
Whether you're an end user or VAR. Big or small. We can configure a multi-user, multi-tasking, multi-vendor system that will make everyone happy. Think of us not just as computer manufacturers but as consultants. The Peacemaker in the Computer Wars.

Take the first step toward peace. Write us at 10700 N. De Anza Blvd., M/S 42-20A, Cupertino, Calif. 95014. Or contact us toll-free at 800-262-4488, ext. 731 (in California, 800-252-4488, ext. 731).



MOTOROLA
Computer Systems

VISION is a registered trademark of Motorola Computer Systems, Inc. Motorola Computer Systems, Inc. is a subsidiary of Motorola Inc. Motorola and the Motorola logo are registered trademarks of Motorola Inc. IBM is a registered trademark of International Business Machines, Inc.



HOW A FLEXIBLE SYSTEM KEEPS YOUR COMMUNICATIONS MOVING SMOOTHLY.

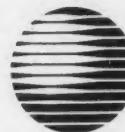
The goal is the same for everyone: control of your business communications. In our view, the key to control is flexibility.

The AT&T System 75, an integrated voice and data system, gives you the flexibility to control your communications and adapt to your ever-changing needs.

Its modular architecture lets you put together a system specifically tailored to your business—one you can change and rearrange at will. As your business grows, the system keeps pace, expanding to up to 800 lines.

By controlling your system's design, you also control its cost, buying only the functions and features you need when you need them. Our standard messaging features help you control the flow of information, making sure calls get through. And with special features like Automatic Route Selection and Call Detail Recording, you'll not only control costs but misuse of the system as well.

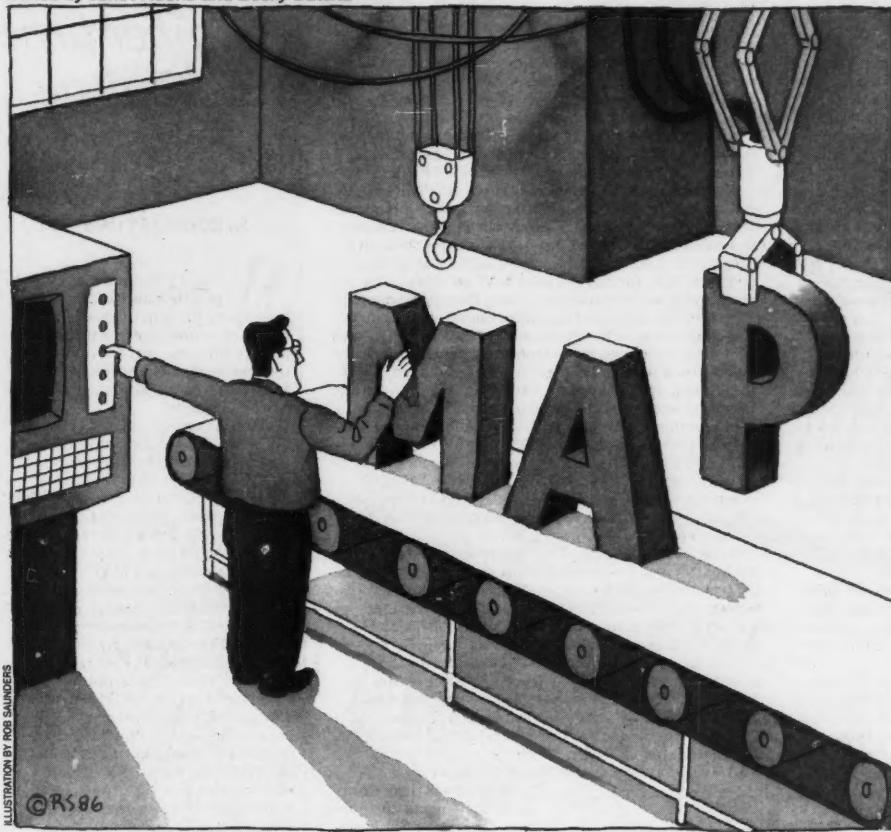
For a free brochure about how AT&T can put you in control of your business communications, call us at 1 800 247-1212, Ext. 498.



AT&T
The right choice.

Executive Report

Edited by Janet Fiderio and Becky Batcha



Moving toward MAP Until 3.0 arrives, a pilot project is your best bet

By MICKEY WILLIAMSON

If you are an MIS manager in an industrial shop — relax. You have time and a variety of products with which to experiment before you adopt a set Manufacturing Automation Protocol (MAP) implementation plan. As a networking standard, MAP will not stabilize for at least another year.

MAP-standard products that users can buy today are built around Version 2, specifically the currently available MAP 2.1, and MAP 2.2 — an enhancement due out this month.

It is the prospect of Version 3.0, with which these versions are not fully compatible, however, that gives some managers reason to hold off on large-scale commitments.

MAP 3.0 is scheduled for arrival sometime next year and will most likely carry the standard into the future (see story page 49).

But the protocol's instability is no reason for users to shy away. According to most observers, anyone who expects to someday implement a factorywide MAP network should start working on a

pilot project as soon as possible, because the learning curve is terribly steep.

"We tell people they should proceed cautiously: Evaluate it and have a pilot study to get their people more involved in the overall technology," says Raj Melville, an associate with Booz, Allen & Hamilton, Inc. of Lexington, Mass.

Bob Crowder, president of Ship Star Associates, a Newark, Del., consulting firm, concurs. "I recommend that they install 2.1 pilots: one robot, one machine tool and their favorite host."

Charles Gardner, coordinator of MAP development at Eastman Kodak Co. in Rochester, N.Y., suggests the pilot approach too. He urges people who want to automate around MAP not to wait but to get involved right away.

"The technology is complex enough that you've got some lead times and learning curves that you've got to go through," Gardner says. "Nobody's going to hand you a pill that you swallow, and you've got it. You've got to grow the skills within your company." Gardner also serves as chairman of the U.S. MAP/Technical Office Protocol (TOP) steering committee.

One good example of how to conduct a pilot program comes straight out of General Motors

Williamson is a technical journalist based in Warwick, Mass. She is the author of Artificial Intelligence for Microcomputers (Simon & Schuster, Inc., 1986).

INSIDE

Weyerhaeuser takes a cautious approach/44

DEC runs with Version 2.1: An interview with Wayne Adams/47

Does the specter of 3.0 slow MAP acceptance?/49

The market grows: 30 vendors offer products/51

Users group sanctions conformance testing/53

Conducting a pilot will help you and your staff master a steep learning curve and examine the largely unexplored technical issues of this standard.

Until 3.0 arrives, a pilot project is best bet

Continued from previous page

Corp., where the push toward the standard first originated. The pilot, now under way in a GM facility in Saginaw, Mich., will serve as the basis for a factory-of-the-future installation nicknamed Vanguard, with which GM will begin making front-wheel-drive axles during the first half of 1987.

In the completed network, 55 manufacturing cells will be linked via MAP to perform light assembly and metal working. All materials will be moved from station to station by automatic guided vehicles.

Engineers will be able to implement model changes in 10 minutes or less by downloading programs from computer-aided design and manufacturing (CAD/CAM) workstations. The factory will employ no direct labor whatsoever, according to Mark Cocroft, GM's technical spokesman for MAP.

The pilot implementation of Vanguard consists of just one manufacturing cell, an entity whose main components are a Stratus Computer, Inc. FX-600 host and a Maxitron Corp. cell controller. The two machines are linked via a Concord Data Systems, Inc. backbone MAP net. Robots, material handling devices, numerical control machines and other peripheral equipment hang off proprietary links to the backbone network.

Mark Adler, a supervisor in GM's MAP group, says the pilot installation has tremendous bearing on the success of the full-scale network, since the larger network consists of interconnected single cells. "It's very important that we do have successes in this initial implementation," he says.

Besides leading to bigger and better things, the pilot has benefits in and of itself. Adler points out that GM is building bridges between personnel in various operating departments — one of the most important outcomes any firm can get from a pilot effort.

People from production and those from quality control, for example, typically harbor some bad feelings about each other and rarely cooperate on anything. But for MAP to work, they must get along, Adler says. Companies need to convince working groups to overcome their difficulties because the smooth flow of information — the overriding goal of a MAP effort — depends on cooperation.

By bringing people from various departments together for the first time, a pilot leads the way to good communication further down the road. Pilot implementations also bring staff members into contact with the technical issues of MAP, which is largely unexplored territory.

Adler says the most important technical knowledge that GM workers pick up through pilots is an understanding of how to integrate components: how, for example, to program a cell controller to address a particular device. The understanding that technicians gain from trying out various schemes at the pilot stage leads to better application design in the long run, he says, because developers come to understand what their applications can gain from each device on a network.

The Vanguard pilot is currently based on MAP 2.0, and GM expects to upgrade it to 2.1 without much trouble. Incompatibilities between 2.1 and 3.0, on the other hand, have given the firm some cause for concern, but they haven't held back the pilot effort. "It is an issue," Adler says, "I'm not going to deny that." But the GM MAP task force's compatibility committee is addressing the problem, and Vanguard participants are disregarding it for the time being.

Crysler Corp. and Ford Motor Co. have also adopted a pilot approach similar to the one GM followed. Chrysler is currently receiving bids from vendors for a pilot manufacturing project at its Outer Drive Manufacturing Technical Center in Detroit. By

the end of the year, the firm expects to test MAP in MIS applications as well.

Ford is building a small-scale installation in its Rawsonville, Mich., production plant. The pilot production network will connect equipment from Allen-Bradley Co., Hewlett-Packard Co. and Motorola, Inc.

Companies outside the manufacturing arena are also following suit by putting together a few test projects before they commit their operations to MAP.

Eastman Kodak is developing three MAP pilot applications, for example. People from various departments in the company will be able to see the projects in action and enlist any one of the three networks for their own operations. And IBM has a project under way in its Endicott, N.Y., facility. Its pilot MAP network links engineering workstations to factory floor equipment.

Roy Yee, principal computer operations engineer of technical and industry control systems for Ford, says pilot tests conducted away from the production line are especially important because the MAP standard is still undergoing so much change. Given MAP's youth, no one knows for sure whether any one vendor's "MAP-standard" products will work with any other vendor's.

Until purchasers can be assured of the interoperability of equipment (see story page 53), putting a MAP network together will take a considerable amount of expertise — and the ability to ask the right questions. Through pilot projects, users can learn what they need to know and what they need to ask.

Buyers of MAP networking equipment need expertise in broadband network operation, token passing, the file transfer access method and the manufacturing message format standard. Without this knowledge, they will not be able to structure their applications to take advantage of MAP's efficiencies.

They also need to understand what parts of the protocol's architecture specific vendors implement in their products. "It's very possible that vendors who claim to conform to MAP conform to different parts of it or don't conform in the same way," explains Ship Star Associates' Crowder.

Crowder says users should ask vendors exactly which options their equipment implements. In addition, he says, "I would absolutely ask each vendor I talk to if they can interoperate with each other vendor. That's what I'd get in the contract."

The importance of a pilot in determining interoperability cannot be overstated. People who skip this step, Ford's Yee warns, risk embarrassment if things do not work together when they are installed.

Still, companies that already feel at ease with broadband networking concepts can adopt large-scale MAP 2.1 imple-

mentations without spending time and money on preliminary tests and pilots. The Deere and Co.'s John Deere Harvester Works in East Moline, Ill., serves as a good example of this direct approach to MAP networking.

The factory has installed a Concord Data Systems token-bus network that links a Digital Equipment Corp. VAX-11/730 in the computer room and spot welders on the factory floor. On the same network, engineers at Computervision Corp. CAD/CAM workstations download programs onto a Numeritronix, Inc. digital numerical controller, which, in turn, transfers instructions to a Behrens, Inc. punch press and a Karl Engen Fischer, GmbH shear.

The MAP installation at John Deere began almost immediately after the first public demonstration of a MAP system at the July 1984 National Computer Conference in Las Vegas. The project was part of an overall technology upgrade, according to David Scott, division manager of computer-integrated manufacturing (CIM) services.

User Profile

Lumber firm optimistic but cautious

By ROSEMARY HAMILTON

While a select number of high-profile manufacturers have been spotlighted in the Manufacturing Automation Protocol user community for their implementations of the standard, there are many manufacturers who are approaching MAP more cautiously.

Such is the case at Weyerhaeuser Co., a \$5.2 billion diversified forest products concern based in Federal Way, Wash. According to Weyerhaeuser's MAP project manager, Dan Miklovic, the company is fully committed to MAP but would rather wait until the standard is "nailed down" before installing any MAP networks.

Weyerhaeuser has proceeded slowly with MAP, because a number of technical issues remain unresolved. "For our facilities that need nonbroadband MAP, there is still no standard. Carrier band doesn't have a specification yet," Miklovic says. "For our facilities that do need broadband — they number between six and 10 — we don't want to do MAP for MAP's sake. We still have an education process to go through concerning what we need and why we need it."

Weyerhaeuser became interested in MAP in 1984, when it was invited to attend a users group meeting. Out of curiosity, the company sent a representative but soon realized MAP's applicability for its facilities. The company has approximately 100 manufacturing shops in North America for its production of lumber, pulp and paper.

The company became the third corporate affiliate member of the MAP Users Group in 1985, which has since been renamed the MAP/TOP Users Group. In January of this year, Miklovic was officially named MAP project manager for Weyerhaeuser.

Since that time, Weyerhaeuser has selected two of its manufacturing facilities as possible MAP pilot sites and is also planning to install a small MAP network in its research and development facility as a MAP laboratory. Miklovic says he will likely receive the go-ahead for the MAP laboratory by year's end but does not expect the pilot project at a Weyerhaeuser manufacturing facility to begin until sometime next year.

The two possible pilot sites — one is located in the Pacific Northwest and the other is based on the East Coast — were chosen because "they have a definite need," Miklovic says. Both plants currently operate on proprietary networks, allowing for communications only between those

See HAMILTON page 46

HAMILTON is a senior writer for Computerworld.

Who lets you generate, test, and run CICS applications on a PC today?



Computer Corporation of America.

CCA's new release of Accolade is the only applications generator that lets you develop, generate, test, and run command level COBOL applications on both the mainframe and the PC. Not only in MVS, but in DOS/VSE. And it's available now.

With Accolade, you can even run distributed applications on either the mainframe or a PC. No other applications generator can offer you that.

Accolade's applications are much more structured, too. You get tightly designed code that executes very efficiently. In fact the average Accolade program requires 2 to 4 times less memory than other generated CICS applications. It's the result of a simple, specifications-driven generation process. And it means that your programmers will be able to generate programs up to 15 times faster than normal.

Accolade is the first applications development system to offer this highly productive combination of tight structure and portability. Its facilities are complete and identical under CICS and PC-DOS with applications transportable between them at specification and source code levels.

Accolade provides direct access via supported interfaces to

VSAM, Model 204, DL/1, and DB2. Any DBMS or file manager may be accessed from Accolade programs.

Find out more about this rich productivity tool from CCA. Send the coupon or call John Donnelly at 1-800-258-4100, ext. 705.

DB2 is a registered trademark of International Business Machines Corporation.

Please send me the complete story on Accolade.
Mail to: Four Cambridge Center, Cambridge, MA 02142.

Name _____

Company _____

Title _____ Telephone _____

Address _____

City _____ State _____ Zip _____

Computer Corporation of America

CC A Crownisk Company

CW

New Dimensions in Software Productivity.

Continued from page 44

Although the company bypassed the pilot stage, Scott says, it did not do so without a safety net. "We thought the basic technology — radio frequency signaling over broadband cable — was proven enough," he explains. "Besides, we had an inexpensive fallback position if the MAP didn't work. We knew we could connect radio frequency modems point to point via broadband cable. We knew that would work, so it was a fairly low-risk project."

John Deere never had to rely on the fallback option, because its network operated pretty much as planned. And given the opportunity to do it all again, Scott says he would proceed exactly the same way.

"I'm not really sure MAP 3.0 is a good excuse for not buying anything

"Until purchasers can be assured of the interoperability of equipment, putting a MAP net together will take a considerable amount of expertise — and the ability to ask the right questions."

right now," he says. "You're never going to be able to get on the phone and call your vendor and say, 'Ship me two CIMS, or ship me a MAP.'"

In addition, Scott says, companies that wait for the ultimate solution in any type of automation project typically end up waiting for a long, long time.

Another organization that is skipping the pilot stage and the wait for

MAP 3.0 is the U.S. Army's Depot System Command in Chambersburg, Pa., which is currently receiving bids on MAP automation for three regional warehouses: the Sharp Army Depot in Lathrop, Calif.; the Red River Army Depot in Texarkana, Texas; and the New Cumberland Army Depot in New Cumberland, Pa. "They're biggies," says Joseph Sharrah of the Depot Systems Command.

"We're talking in the hundreds of millions" of dollars.

The three MAP systems will fill materials requisitions that come in over the Defense Data Network, comparing orders with inventory records and handling "all the logistics of getting the thing out the door," Sharrah says. Human beings will perform the actual physical labor of assembling the orders, but the system is designed to be "as much as possible a paperless warehouse."

Although the project will not be complete until late 1988, Sharrah says the Army specified MAP 2.1 because "2.1 is the industry standard now, and 3.0 is a thing to come. We want to go with a standard that is state of the art but proven." He says 2.1 is "on the leading edge and is usable, even if there are still some problems with it."

One of MAP 2.1's main drawbacks is its inability to support process manufacturers, companies that take raw materials and convert them into finished goods, as opposed to discrete manufacturers like the auto makers, which assemble manufactured components to form complete products.

Process manufacturers need higher communications speeds and higher levels of reliability than MAP was initially designed to provide, according to John Bernard, an associate with Cimdata, Inc., a Wellesley, Mass., firm that does consulting and market research in the area of computer-integrated manufacturing. "They have to worry about a whole host of environmental considerations, on one hand, and safety in

HAMILTON from page 44
systems made by the same vendor. Each facility has equipment from three separate vendors.

The Pacific Northwest plant operates on systems from IBM, Hewlett-Packard Co. and Data General Corp. The East Coast site has equipment from IBM, HP and Digital Equipment Corp.

When the MAP networks are installed, Miklovic says he expects to see vast improvements in communications at the facilities. One immediate payback will be providing plant-wide information to managers.

"Our operations people with modeling and simulation tools could have access to performance data to determine what effects any major changes in processes would have," Miklovic claims.

In the meantime, he devotes approximately 45% of his time to what he calls the MAP education process. "You have to remember that there are no MAP experts out there for sale," Miklovic says.

"You need to grow your own, and I'd say it takes one to two years to become knowledgeable on what's real and what isn't."

Miklovic is pleased with Weyerhaeuser's progress and its decision to take a cautious approach to MAP implementation.

"I'll let the others do the bleeding," he says in reference to the number of experimental MAP projects under way. "GM has been spending its money because they need MAP more than we do. We're still answering the question of what we need it for."

TORCH THE BACKLOG

WITH REALIA COBOL ON A PC

The fastest micro COBOL.
Now, the fastest SORT.

IBM mainframe COBOL compatibility.
Superb support.

10 South Riverside Plaza
Chicago, IL 60606
Phone: 312/346-0642
Telex: 332979

REALIA
inc.

Executive Report/MAP

the face of hazardous conditions on the other."

Version 2.2 meets some of those needs. For example, it supports real-time capabilities that allow one device to immediately acknowledge the receipt of a message from another.

Further, it adds to MAP's broadband, multichannel capabilities the specification for a carrier-band, single-channel net. Manufacturers can use carrier-band networks as mini-

MAP nets within individual manufacturing cells on the shop floor. The various cell networks can then be linked to others via a broadband coaxial-cable backbone.

Carrier-band networks offer users a relatively inexpensive way to link devices, because they do not require the expensive head-end electronics that broadband networks do.

Adding Version 2.2 capabilities to an existing 2.1 network should not

create any problems, according to Gary Workman, coordinator of GM's MAP development team, because 2.2 is 100% compatible with 2.1. "Every 2.1 system is a 2.2 system," Workman says. "Having selected the proper options, all you need is a router or bridge between the broadband and mini-MAP networks."

The release of Version 3.0 next year will create incompatibilities, though. Version 2 and 3.0 systems

will not communicate directly. MAP's proponents, however, stress that the two can coexist on the same coaxial cable network, even on the same broadband channel.

With compatibility issues outstanding as they are, multi-vendor factories need to reconcile MAP with their total communica-

Continued on next page

Interview

With Version 2.1 in hand, DEC plans for MAP compatibility

By MARCIA BROOKS

Digital Equipment Corp. is one of the most prominent vendors of general-purpose computers for factory floor applications, and, like other vendors that want to sell to General Motors Corp., it has agreed to support the Manufacturing Automation Protocol.

More than other computer vendors, however, DEC has built its strategy around communications among various classes of processors. Its Decnet architecture supports links to external communications environments and to the IBM Systems Network Architecture world, but it was primarily designed to optimize communications among DEC's own processors.

Wayne Adams, a DEC marketing specialist for MAP and computer-integrated manufacturing (CIM) products, told Computerworld about the Manufacturing Automation Protocol's position in DEC's long-term strategy during a recent interview.

When did DEC decide to conform to Open Systems Interconnect (OSI) standards?

We started our program back in 1980 for OSI, but it was more global than what we know today as MAP. We were looking at the X.25 standard, trying to understand something out there for transport and session layers, X.400 and 802.3.

When did DEC make the decision to go for MAP?

We did some early project work for GM around what's now being termed as MAP — working on the communications standards.

Then in 1984 at the National Computer Conference there was a MAP Version 1.0 demonstration. DEC was a member of that.

More work was started in 1982.

DEC has a reputation of having been reluctant to join the MAP effort. What conditions did the company feel should be in place with MAP before it made its commitment?

There was not enough clearness in the original specification [MAP 1.0] to mount an engineering effort. When there is an incomplete

specification and you develop products — and other companies develop products — chances are that when you try to hook them up, they won't work. When that happens you have to write a lot of custom software to make the "standard" interoperable.

So it was a question of being able to provide downline support?

It wasn't so much support as that there wasn't enough meat behind the spec to go out and put the resources into building something that was going to be worthwhile. With MAP Version 1.0, the concept was there and so was the momentum for the industry standard. But who is

homogeneous environment.

At this point, we want to migrate our Decnet architecture over the course of time to become more OSI-conformant.

Let's switch our focus to implementation. How would you characterize current DEC customers — with the exclusion of GM — that now specify MAP for factory networks? Are they large or small companies, and where are they in their CIM planning?

They make up the Fortune 50 or Fortune 100 companies, and they're starting out following the same suit that GM has: Asking the vendors that they are dealing with in their

needs to network together their manufacturing facilities. For them to invest in the broadband network and invest in custom applications and to change the applications when MAP 3.0 arrives is just too costly.

These companies look at automation once, and they want it to solve their needs for five years. They don't look for involvement in an automation project the size and nature of GM's.

Which DEC products are prioritized for MAP connections or MAP compatibility?

Right now our VMS operating system and our VAX line of computers.

What does that mean for the PDP-11s that are the workhorses of the factory?

They are the workhorses of the factory, and we are looking at incorporating MAP in the PDP-11. At this stage of MAP's evolution, we feel VMS provides the most flexible environment to develop applications on and the most powerful processor to work with.

What's DEC's schedule for delivery of MAP products?

If you look at your calendar from Sept. 21 to Dec. 20, well, keep an eye on DEC.

Do the independent interoperability tests some MAP vendors have undertaken have any significance?

We encourage them. We realize the complexity of structuring those tests is very difficult when you're looking at all the combinations of vendors. So what's done already as a head start in the marketplace is very good to help push the MAP business further ahead.

MAP is only the conduit. In implementation, one of the key roles will be as the network manager and lead vendor. Does DEC have an interest in being the lead implementor or systems integrator that coordinates and orchestrates a plant installation among multiple vendors?

We have done that in the past in our software services organization, which takes care of project management and establishes itself as prime contractor.

In addition, we will be announcing a network package geared around our Decnet architecture that will eventually encompass MAP. That will be coming out later this year.



ILLUSTRATION BY KEN GORDON

DEC's Adams

going to buy MAP Version 1.0? MAP Version 2.1 had enough detail and all the layers of the reference models to build the product.

In which situation would you recommend Decnet vs. MAP for factory implementation?

That's a very good question, and it's really up to the customer to evaluate.

If he's going to work with one type of programmable controller throughout a factory network that will handle all of his automation needs, he may not want to install a complete broadband MAP network or have a need for several data networks on one cable plan. He may be able to get away with developing one protocol converter between our host and their programmable control environment.

But if that same user is looking to expand in the future with other devices, it may be worth the investment up front to invest in MAP.

Decnet was designed primarily to talk between DEC computers. That is its major strength — talking in a

When there is an incomplete specification and you develop products — and others develop products — chances are that when you try to hook them up, they won't work.

CIM planning to supply more MAP products for the processor.

Some of them have taken a conservative route, starting out in the lab and installing just a few processors from different vendors — just getting familiar with broadband networking, with token passing and timeliness and so on.

Are most of them at this point discrete manufacturers, as opposed to process manufacturers?

I would tend to say the majority are discrete, because MAP came out of discrete manufacturing. But now the process industry users are getting involved.

Do you expect the MAP standard to penetrate beyond the Fortune 100 community?

Yes. I would tend to think so when MAP 3.0 and further versions come out.

Some of the smaller companies — the Fortune 500 to Fortune 1,000 — only have a need for one data network. They view the carrier-band network as being sufficient for their

Brooks is a senior analyst in International Data Corp.'s computer-integrated manufacturing service. She is also editor of the monthly newsletter, "The CIMS Report."

Continued from previous page

tions environment. Indeed, companies contemplating a MAP installation should make it part of a full CIM plan.

Marcia Brooks, a senior analyst in International Data Corp.'s (IDC) computer-integrated manufacturing service and editor of the monthly newsletter, "The CIMS Report," is emphatic about the importance of a CIM plan. "Any company that's serious about being in manufacturing for the long term is foolish if it doesn't develop a CIM strategy at this point," she said.

CIM means linking an entire company — from the shop floor to shipping and receiving to inventory, purchasing, engineering, accounting, finance and planning and even possibly to terminals at the point of sale



”

'The most important knowledge that workers pick up with pilots is an understanding of how to integrate components.'

— Mark Adler
General Motors Corp.

and in suppliers' offices — for just-in-time inventory management. CIM turns a multitude of departments and divisions into an organic whole, yielding benefits in terms of costs and efficiency.

CIM, of course, depends on network communications. And increasingly, MAP is the protocol of choice to assemble the network. A mammoth undertaking, CIM is implemented in stages, with each stage careful-

ly planned beforehand.

Whether the plan must be complete before any MAP implementation begins is a matter of debate. Ship Star Associates' Crowder thinks companies should set their CIM plan before they attempt any full-scale implementation but not necessarily before they proceed with a pilot.

"My experience from consulting with customers is that they are far better off if they do have a full CIM plan, because the big economic benefits of MAP are from CIM," he says. "If you don't have a CIM plan, you don't have the full benefits of MAP."

But Michael Kaminski, project manager for General Motors' MAP project and MAP's founding father, thinks a complete CIM plan — one that links all business and manufacturing efforts within a large organization — is a completely unrealistic goal.

At GM, he says, "We've been working on it for five years, and we still have a long way to go." What is needed, Kaminski adds, is "a plan that gives you some strategic advantage, one that you keep on updating as you implement so that you can move gracefully as new technologies come into being."

Not every company needs such high levels of integration. Booz, Allen & Hamilton's Melville says that shops with fixed configurations that include a limited number of devices from a single vendor may well want to sit out on MAP implementation altogether.

Among smaller manufacturing companies, cost remains a major issue. Prices vary considerably, depending on what devices are being linked. A basic MAP starter kit that connects two nodes — anything from a robot controller to two personal computers — costs around \$60,000, not counting installation expenses.

A typical starter kit might include two personal computers, communications cards for each of them, coaxial cable and hardware to connect them and a head end, which converts radio signals transmitted from one node into signals that can be received by the other. Transmission is always at low frequency, reception always at high frequency; the head end, which makes the conversion, is a necessary first buy in any broadband network.

Each node after the first two costs about \$3,000. "To do anything significant in manufacturing, you're certainly over a hundred thousand dollars," Ship Star Associates' Crowder says.

That is too much for many companies, including Rexnord, a \$1.1 billion conglomerate with interests in both discrete and process manufacturing at more than 80 locations worldwide.

At Rexnord, Tom Harris, manager of systems development for the firm's manufacturing research center in Milwaukee, Wis., is responsible for monitoring developments in the MAP standard. He feels current MAP prices are too high.

"I don't see the cost/benefit until you are in a large processing plant where there are a lot of activities going on that need attention right away," Harris says. "In most of our applications, we have very limited

Continued on page 52

Cash in on CAD/CAM at COMDEX/Fall.



This year, COMDEX/Fall features CAD/CAM to help CAD/CAM vendors and resellers turn this dynamic technology into a powerful profit tool.

For CAD/CAM vendors, CAD/CAM at COMDEX draws the tens of thousands of resellers you need to reach a global market. And for resellers, COMDEX connects you to the companies with the hardware, software, peripherals and service opportunities that can help you wring cash from CAD/CAM.

A special one-day CAD/CAM seminar on November 13 shows resellers how to wield the power of CAD/CAM to build new profit opportunities. Explore the technology, who uses it, how to sell it, and what it can return to you in this exclusive session.

Put CAD/CAM to work for you November 10-14, 1986. And set aside November 13 for the special CAD/CAM seminar. For more details, send in the coupon now!

I want to cash in on CAD/CAM!		
<input type="checkbox"/> Send me complete exhibiting information.		
<input type="checkbox"/> Send me complete registration information.		
<input type="checkbox"/> I plan to attend the CAD/CAM seminar		
Name	_____	
Title	_____	
Company	_____	
Address	_____	
City	_____ State	_____ Zip
Telephone	_____	
Return to: David Thurman, COMDEX/Fall '86 300 First Avenue, Needham, MA 02194		

COMDEX/Fall '86

Join The Winner's Circle
November 10-14, 1986, Las Vegas, Nevada

MAP grows up: Version-filled road to maturity a rocky one

The Manufacturing Automation Protocol is some distance from maturity. As Bob Crowder, president of Ship Star Associates, a Newark, Del., consulting firm, sees it, MAP is like a teenager: "a lot of promise and a lot of development left to go."

Right now, MAP encompasses only six of the International Standards Organization's Open Systems Interconnect model's seven layers. The big step in this adolescent's development comes next year, with the expected release of Version 3.0, which will specify all seven layers.

Companies installing MAP implementations now are using Version 2.1. Some will upgrade to 2.2, a similar and compatible version due to be published this month.

The differences between the two current versions are slight, and users should face no problem whatsoever going from one to the other. But 3.0 products, when they arrive on the

upper software layers. Vendors are telling customers that upgrades will involve downloading new software into existing read-only memory chips in 2.1 devices. At worst, some say, users may need to replace some network interface units. MAP devices are meant to not become obsolete.

Because the move from Version 2 to 3.0 will not be a seamless one, however, some observers say that users who wait for 3.0 are perfectly justified in their actions. "There's work to be done if you upgrade," notes Marcia Brooks, a senior analyst in International Data Corp.'s computer-integrated manufacturing service and editor of "The CIMS Re-

port," a monthly newsletter.

Brooks predicts that 3.0 will be MAP's "stable state for a while," although the protocol will undergo change, and says that users can feel safe with Version 3.0 as their baseline. "People can start to implement and be assured that they have compatibility," she says, providing that MAP 3.0 lives up to expectations and that vendors can prove their products meet the standard.

Brooks is also among those MAP proponents who look on the U.S. economy's current sluggishness as a blessing in disguise. The slump gives MAP time to mature before business gets moving and industry starts buy-

ing equipment again, they say.

"The best thing that can happen to MAP is if the economy just stumbles along for a while and people don't get ramped up to do their major manufacturing plans for a year or two," Brooks says. If users can just hold off on their purchases until vendors have time to respond to 3.0 with fully compatible equipment, Brooks says, the standards effort will be more or less home free.

She adds, however, that MAP is now well enough established that an early boost in the economy wouldn't hurt it. A year ago, she says, that would not have been the case.

— MICKEY WILLIAMSON

Without the right connections, you could pay a lot to deliver a little raster data.

There's no question that a raster processor is a wise investment. Without it, your computer is loaded down processing raster data for your hard copy devices. But unless you're careful, you could pay a fortune for a processor with more capacity than your plots demand.

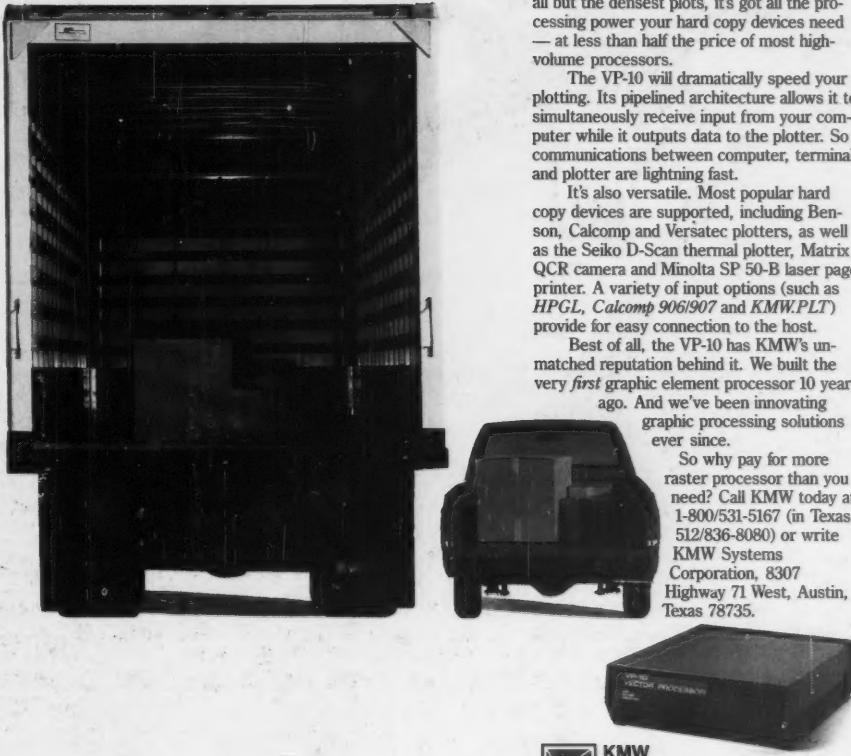
That's why we designed our VP-10. For all but the densest plots, it's got all the processing power your hard copy devices need — at less than half the price of most high-volume processors.

The VP-10 will dramatically speed your plotting. Its pipelined architecture allows it to simultaneously receive input from your computer while it outputs data to the plotter. So communications between computer, terminal and plotter are lightning fast.

It's also versatile. Most popular hard copy devices are supported, including Benson, Calcomp and Versatec plotters, as well as the Seiko D-Scan thermal plotter, Matrix QCR camera and Minolta SP 50-B laser page printer. A variety of input options (such as HPGL, Calcomp 906/907 and KMWPLT) provide for easy connection to the host.

Best of all, the VP-10 has KMW's unmatched reputation behind it. We built the very first graphic element processor 10 years ago. And we've been innovating graphic processing solutions ever since.

So why pay for more raster processor than you need? Call KMW today at 1-800/531-5167 (in Texas, 512/836-8080) or write KMW Systems Corporation, 8307 Highway 71 West, Austin, Texas 78735.



KMW SYSTEMS CORPORATION
For the right connections

Autocom is now a division of KMW Systems Corporation.

Registered trademarks: Benson — Benson, Inc.; Calcomp — California Computer Products, Inc.; Versatec — Versatec, Inc.; Matrix QCR — Matrix Corp.; Minolta SP 50-B — Minolta Corp.; Seiko D-Scan — Seiko Instruments U.S.A.

scene, will not converse with Version 2 software, although they may coexist on the same network.

The specter of a new and incompatible protocol specification is keeping many companies from implementing full MAP networks now. Michael Kaminski, project manager for General Motors Corp.'s MAP project and one of MAP's founding fathers, considers the excuse a weak one.

Users' reluctance, Kaminski says, is based on an outdated way of looking at manufacturing technology. "They think you put it in once and that's it," he says, whereas MAP requires gradual, continual change. "We've got it set up so that it doesn't make itself obsolete; it adds functionality."

Companies should be able to port their Version 2 MAP configurations to Version 3.0 without tremendous difficulty. And, as Gary Workman, coordinator of GM's MAP development team, says, "There's no throwing away of things."

Most 3.0 changes will be in the

Only Stratus has the fault tolerant technology today to support the MAP systems of tomorrow.

Tomorrow is filled with big promises. Among them, MAP. But the only way to realize the big promises of tomorrow is with real performance today.

And today, while a great many computer companies are gearing up to toss their hats into the MAP ring, only one computer company has already checked-in with real fault tolerant performance. Stratus. In fact, Stratus computers are hard at work right now at the world's leading MAP pilot project - the automotive Factory of the Future.

What makes Stratus so special? Simply this: Stratus Computers feature hardware-based fault tolerance - the only architecture reliable and efficient enough to meet the high volume demands of the MAP environment including shop floor process control, flexible manufacturing, and device hook-up.

They're extremely powerful, extremely fast transaction processing systems that offer complete connectivity to everything from programmable devices to corporate mainframes via LANs and WANs. And they support a wide range of software resources.

No one is more excited about tomorrow than Stratus. And that is precisely the reason no one is better prepared to get you there today.

For an informative article on MAP, Stratus, and the Factory of the Future, call our Marketing Services Dept. today at 1-800-752-4826 (in MA, 617-460-2000).

Stratus
Continuous Processing
Stratus Computer Inc., Marlboro, MA 01752

Choose your weapon: Compatible products are available

Young MAP mart has more than 30 vendors

By MEREDITH GREMEL

Computer and communications equipment vendors have not exactly flocked around the Manufacturing Automation Protocol, but they are selling enough MAP-standard products to give buyers at least a little bit of choice.

Users who want to buy MAP equipment can choose from among approximately 14 different seven-layer communications servers, for instance. They can also pick from five different cell controllers, five programmable controllers, three robot controllers and two workstation controllers.

Gremel is editor and senior writer for "Gateway: The MAP Reporter" and the MAP/TOP Product Directory, which are produced by the Industrial Technology Institute (ITI) an organization that helps manufacturers put advanced technology to use. ITI is based in Ann Arbor, Mich.

In addition, buyers can decide among 12 box- and board level MAP interfaces, 11 protocol software packages, five broadband and carrier-band modems, four gateways and two bridges.

The market also supports at least three different types of broadband monitors and control systems, two traffic analyzers and two head-end remodulators.

All told, just more than 30 vendors offer about 125 products and technical services that are designed to meet MAP 2.0 and 2.1 specifications.

On the surface, these figures seem fairly unimpressive. But skeptics need to take into account the market's relative youth: The MAP movement is only 6 years old. Nay-sayers should also note that some influential vendors are paying more and more attention to the standard.

Of the 30 or so vendors of MAP-standard products listed in the MAP/TOP Users Group's MAP/TOP Product Directory, 13 are Fortune 500 companies that can devote a lot of resources to the development and marketing of their product lines. They include Digital Equipment Corp., Fairchild Camera and Instrument Corp., General Electric Co., Gould, Inc., Honeywell, Inc., IBM,

Intel Corp., Motorola, Inc., Square D Co. and Texas Instruments, Inc.

Smaller but equally involved players include Advanced Computer Communications Co., AEG, Allen-Bradley Co., Computrol, Concord Data Systems, Inc., Industrial Networking, Inc., Maxitron Corp., Network Technologies International, Inc., Stratus Computer, Inc. and Touch Communications.

During the last four years, vendors have invested about \$100 million in MAP research and development, and few have made the commitment lightly. Many MAP-compatible products compete head-to-head against their manufacturers' incompatible proprietary product lines. Having undertaken such a significant investment, the vendors seem likely to remain committed to MAP.

Some user companies — typically those in the top fifth of the Fortune 500 — are also forging ahead with MAP implementations, despite the market's youth. Boeing Corp., Chrysler Corp., Deere & Co., Ford Motor Co., General Motors Corp., Inland Steel Co. and others in this league are not discouraged by the scarcity of available products. Instead, they seem impatient to work with whatever comes to market.

"We wanted to get actual hands-on experience as soon as possible," says Robert Yee, MAP project manager at Ford. Ford started installing MAP-standard products early this year. Now that users at Ford feel comfortable with MAP technology, Yee says, the standard will influence all network planning and factory design.

Smaller manufacturers, however, are withholding their support for the time being. They want the vendor independence that MAP promises, but they also want to see honest results before they make any strong commitments.

Many cannot afford to put their money down on anything but a sure bet. After all, the risk of running a production facility on unproven technology is a great one. Failure, or even complications, could ruin a business.

A recent report by Sanford C. Bernstein & Co., a research and consulting firm in New York, notes that MAP seems likely to show a strong but incremental influence over the industrial networking market. "Most likely, MAP will be phased in gradually while non-MAP-based equipment remains on the market for some years," according to the Bernstein report.

\$180 OEM Mini Terminal Programmable & Data Capture



Intelligent Mini Terminal

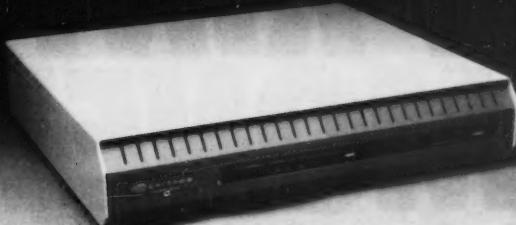
Z80 Full Function Terminal \$180 in LARGE QUANTITIES, One Line Screen, Alphanumeric Keypad, 2 Phone Jacks, Internal Modem, MAG Card Reader, Serial Port, Custom Application Programming Language, Battery Backup for Data and Real-time Clock Calendar, Data Store and Forward. 100,000 U.S. Installations, TYMNET, TELENET, COMPUSERVE, CONTEL, GEISCO, ETC. Table/Wall, 2.2 lbs., 1.5" x 5.5" x 6", Custom Faceplates, MFG, HOSPITAL, MEDICAL, HOME, GOVT., TIMECLOCK, ETC.

Call Anytime in the U.S. and Canada
800-628-2828 ext. 861



VeriFone Inc 3040 Redhill Ave., Costa Mesa, CA 92626

Ethernet Is Now Available On Broadband



Using ETHERMODEM from Chipcom, you can easily utilize, for the first time, the inherent flexibility of broadband while preserving your existing investment in Ethernet hardware and software.

ETHERMODEM provides the same performance on broadband as baseband Ethernet, including high speed links between computers, workstations and CAD/CAM equipment and equal and fair access to all network users, while delivering the high level of trouble-free performance required in large installations.

For more information on how you can realize the benefits of Ethernet on Broadband, call or write to Karen S. Poole.

ETHERMODEM Features:

- Compliant with new (September, 1985) IEEE 802.3 broadband standard - AUI compatible
- Full 10Mbps CSMA/CD performance
- Available for single cable or dual cable installations
- Functions on mid split or high split networks
- Five frequency ranges to avoid conflicts with services such as MAP, Sytek's LocalNet 20, IBM's PC-NET and others
- 5.500 Meter coverage or over 9.1 sq miles
- Cost/connection addressed by dual port and 8 port models
- Built-in digital and RF diagnostics
- Immediate Delivery
- Transparent to higher level Network Software DECnet, TCP/IP and XNS

CHI PC CORP
ORATION

195 Beer Hill Road, Waltham, MA 02154 - Tel. (617) 890-6849
195 Beer Hill Road, Waltham, MA 02154 - Tel. (617) 890-6844
LocalNet is a trademark of Sytek Corporation
ETHERNET is a trademark of XEROX Corporation

Executive Report/MAP

Continued from page 48
needs to communicate between two devices."

He uses ordinary RS-232 cable for most of his company's interdevice communications. "A simple RS-232 link, assuming that you have the software you need on either end, costs about \$70," Harris says, compared with the thousands of dollars a MAP connection requires.

He says he feels that Rexnord operates only one facil-

ty with enough sophisticated machine tools and processes to someday benefit from MAP. At that facility, the company is considering the possibility of connecting some highly sophisticated machine tools with a statistical process-control device that will collect bar-coded inspection data for inventory and quality control. As Harris envisions it, the system would also incorporate a CAD/CAM and Manufactur-

ing Resource Planning II software.

Beyond expense, Harris sees security in MAP networks as an important issue that needs resolution. Although he expects future MAP versions to specify a logon and password system for each node, nothing of the sort exists right now. "Once you've got a device attached on a MAP network," he points out, "it can access anything else on the net-

work, anywhere, at any time."

No need to worry about MAP's future

Users who choose to skip MAP for the time being, as Rexnord has, or to wait for 3.0 before they make any commitments need not worry that their lack of interest will doom the protocol to failure. MAP's acceptance is

widespread, and there is no longer any question that the standard will survive.

"MAP's not in any danger from the fact that people are not rushing to implement it," IDC's Brooks says. "There's nothing in terms of a multi-vendor protocol to replace it, and users have shown that they want that. They're tired of the finger pointing, the lack of resolution and accountability on the part of vendors."

A vocal group of MAP users is overseeing the protocol's development. Started in 1984 with 60 members from 42 companies, the MAP/TOP Users Group has grown exponentially. (Like MAP, TOP is a subset of the International Standards Organization's seven-layer Open Systems Interconnect, or OSI, communications protocols.) It now claims some 6,000 members, representing about 1,400 companies.

The membership roster contains names from at least 300 of the Fortune 500 companies, representing a huge chunk of purchasing power. "If you're selling to the GMs and the Du Ponts and Kodaks, you don't have much choice, do you?" Cimdata's Bernard notes. He guesses that half of the nation's vendors of manufacturing automation equipment are in some way affected by the GM initiative.

Initially, Bernard says, many vendors will merely supply gateways to link products. But as volume increases, "they'll redesign their products and start incorporating chips that have MAP protocols embedded in them."

Vendors differ in their approaches to providing migration paths to MAP implementations within their installed customer base. To illustrate, Ship Star Associates' Crowder contrasts the responses of IBM and DEC.

"Digital has a clear plan that they're going to migrate OSI right into Decnet, and users will be able to configure systems that have the best of both worlds," he says. "I haven't seen any clear plan like that from IBM for Systems Network Architecture, and I think it will be a couple of years coming, but they will produce MAP products."

Users, however, keep pushing for IBM-to-MAP connections. Subsequently, there is substantial vendor effort to link IBM's 4300 series and MAP.

Altogether, some 30 vendors, including most if not all of the major computer makers, have announced MAP-compliant products and services, and that list is growing almost daily (see story page 51). True, some vendors' announcements are fairly empty proclamations,

Continued on page 54



PRINT MONEY.

By replacing your IBM 3287 printer with a Datasouth.

Unfortunately, you can't actually print money. But with Datasouth high performance dot matrix printers, you can save it! Take a look at the chart below, and you'll see that

instead of printing money, you might be burning it.

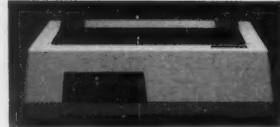
The CX 3180 and CX 3220 are true co-axial printers that are direct replacements for the IBM 3287. They attach to 3274/76 cluster controllers or 4331 Display Printer Adapters without external protocol conversion devices. Both printers do compressed and expanded print. And

both have a Centronics-type parallel interface for PC output.

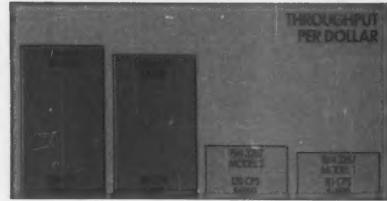
The CX 3180 is a 180 cps workhorse designed for a 100% duty cycle. The CX 3220 is a multimode printer that prints near-letter-quality text at 45 cps, as well as DP output at 220 cps. It also does high-resolution dot-addressable graphics.

Okay. Now you know that Datasouth printers work better and cost less. And if that doesn't exactly give you a license to print money, it will still do wonders for your budget.

To find your nearest Datasouth distributor, call us at 1-800-222-4528.



Datasouth
AMERICA'S HIGH PERFORMANCE
PRINTER COMPANY



P.O. Box 240947 Charlotte, NC 28224 (704) 523-8500 Tlx: 684301B DASOU UW SALES: 1-800-222-4528 SERVICE: 1-800-438-5050 West Coast Office: (818) 702-9065 IBM is a registered trademark of International Business Machines Corporation.

Users group engages industrial institute for product testing

ITI designs, administers conformance test suites

In terms of user and vendor commitment, the Manufacturing Automation Protocol has reached the status of a shop floor standard — a standard, that is, in the same sense that there are standard threads in screws: You still can't assume that any two pieces that fit the standard will fit together.

A standard is not of much use without a way to determine conformance, which is why the protocol's proponents are paying a lot of attention to what they commonly call MAP test suites, procedures that determine whether products that promise MAP compatibility actually deliver it.

The MAP/TOP Users Group has sanctioned the Industrial Technology Institute (ITI) of Ann Arbor, Mich., as its official developer and practitioner of conformance tests. In this role, ITI is something like the Underwriters Laboratory of manufacturing automation.

ITI's test suite for MAP 2.1 is not yet fully developed, but testing is under way nonetheless. Currently, tests are available for four of MAP's six layers — the data link, network, transport and session layers — and for part of a fifth, the application layer. No tests are ready for physical-layer MAP specifications, although the institute is working on them.

Vendors that submit to testing bring their equipment to Ann Arbor to be linked to ITI's test network, which is based on a Digital Equipment Corp. VAX-11/750 host that runs Eunice, a Unix emulator, under DEC's VMS operating system. A vendor's engineers and programmers accompany its equipment in the hope

that they can correct on the spot any problems that surface.

ITI is currently porting its test software to University of California at Berkeley Unix 4.2 so it can run on a Sun Microsystems, Inc. workstation, according to Michael Schumacher, an ITI researcher.

When that is done, vendors will be able to run the tests at their own sites, so they can be assured their equipment will pass the tests when it arrives at the institute. The result should be a less expensive testing process.

Participating vendors are supplied with a test results document, which summarizes the outcome of each test

— noting whether a piece of equipment passed, failed or did not attempt a given procedure — and then details the results of each ITI procedure.

ITI maintains confidentiality concerning test results, although it will, at the vendor's request, confirm that a vendor's equipment has been tested. Vendors must furnish their own copies of the test document for prospective customers. "A purchaser would probably want to see at least the summary page," Schumacher says.

Also part of the testing picture is the Corporation for Open Systems (COS), an organization of vendors

founded in January, which is also working to develop conformance tests. COS, however, is not expected to have tests ready before the middle of 1987.

In theory, products that pass conformance tests should work when connected to others that have passed the same tests, but with MAP in its current immature state, that is not always the case.

So far, Schumacher says, no one is tracking the interoperability of equipment that has passed conformance testing. That is, he adds, "an interesting study that needs to be done."

— MICKEY WILLIAMSON

Systems Education That Works

*Ten years ago we needed to train our system programmers.
So we built an education curriculum.*

It worked.

Now we offer you the results of our years of experience.

Ten years ago we were busy shipping our first line of large-scale processors. As a fast-growing vendor, we needed an increasing number of well-qualified system programmers. So we developed courses for our own programmers.

The courses we developed featured a level of detail about operating systems that had not been seen before. That *in-depth instruction*, reinforced by *hands-on lab sessions*, worked extremely well for us.

As word spread, customers asked to attend. In 1977, Amdahl opened its courses to students from other companies.

The students did not have to be users of Amdahl processors. Then as now, we gave strictly objective instruction, suited to any System/370 environment. In fact, 60% of our students come from non-Amdahl shops.

Two Benefits That Our Education Customers See

A customer told us, "I see two main benefits resulting from our participation in the Amdahl education program. One is boosted morale. The other is increased productivity."

Those benefits come from important course features. Over the years, we kept the *in-depth presentations* that work so well. Paying close attention to DP trends and customer needs, we modified courses to assure that information was *fully practical and technically up-to-date*.

The results for customers: improved performance and confidence.

Expanded Course Offerings

We have greatly expanded our course offerings. You can now choose from 52 courses, covering:

- MVS
- VM

- Communications Systems
- Data Systems
- UTS®/580 (UTS is a full implementation of AT&T's UNIX® System V, Release 2.1, bringing a UNIX operating system to System/370 environments)

and check source code to verify documentation. They produce lab exercises and run them to check accuracy. Then they beta test the course and refine the instruction and exercises. Typically, it takes 19 days to develop 1 day of classroom instruction.

Courses Near You

As we expanded the number of courses, we provided increased support. In 1981 we formed an entire new division — Amdahl's Education and Professional Services Division — devoted to education and consulting. And we opened new facilities.

You can now attend scheduled courses in:

- Atlanta
- Chicago
- Columbia, MD
- Detroit
- Houston
- Los Angeles
- Minneapolis
- New York
- Santa Clara, CA
- Washington, DC

Or you can let Amdahl come to you. Courses are available by contract for presentation at your own site.

Behind our expanded courses and facilities are the resources of Amdahl Corporation, a Fortune 500 company that now provides and supports a full range of products for large-scale data processing.

The Strengths of Our Instructors

We choose our instructors for their depth of technical experience. Then they are trained as teachers.

The depth of their knowledge lets our instructors be flexible in their teaching. They can adjust the level of their presentations in class to the students' level of experience.

As experienced system programmers, our instructors can easily understand student needs and problems. They've been there.

The 1987 Education and Professional Services Catalog

All of our courses for 1987 are described in our new catalog. Call today for your free copy. It is your guide to education that is thorough, practical, and up-to-date.

Let our courses work for you.

To order your free 1987 education catalog, call 1-800-538-8460, ext. 6393.

amdaHL

The Vendor of Choice for Education and Professional Services

Amdahl and UTS are registered trademarks of Amdahl Corporation. UNIX is a registered trademark of AT&T.



COMPUTER ASSETS TRACKING SYSTEM

The first PC-based data center management tool to help you better manage:

- EQUIPMENT ON ORDER
- INSTALLED INVENTORY
- PROBLEM REPORTS
- CHANGE REQUESTS

20% OFF WITH THIS AD
(UNTIL OCTOBER 31, 1986)

To order CATS or a free demo diskette, call or write:



Expanded Course Offerings

We have greatly expanded our course offerings. You can now choose from 52 courses, covering:

- MVS
- VM

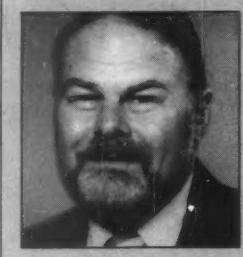
When it's clear a new course is needed, our instructors start the process of course development. They pore over manuals

Continued from page 52

with delivery dates off somewhere in the future. But, according to GM's Kaminski, there are enough MAP products on the shelf to permit users to take the plunge.

Obviously, implementing a MAP network is no trivial task. Factory floor applications typically require users to write custom software, and there is a great deal that a firm must learn about MAP technology before it even begins to think about implementation.

Whether MAP is important enough to spend time learning about, says Eastman Kodak's Gardner, depends on "whether leading-edge technology is important to the survival of your business. If it's not, sit



"If you don't have a CIM plan, you don't have the full benefits of MAP."

— Bob Crowder
Ship Star Associates

back and relax. But if you need to compete in the world marketplace, then you'd better be involved."

Besides linking manufacturing robots and the devices that control them, MAP is intended to connect

factory equipment with the corporate data base as part of a CIM system.

When MAP matures, any vendor's CAD workstations in the engineering department, for example, will be able

to send design changes to any other vendor's numerical controller on the shop floor, which will then relay those instructions to any third vendor's robot. Inspection robots will be able to relay data directly to the corporate mainframe, facilitating the implementation of just-in-time manufacturing systems that depend on 100% perfection in manufacturing components.

The MAP protocol will eventually link payroll records, shipping registers and accounts receivable — virtually every aspect of a company's operations with every related part of the corporate data base.

GM's Kaminski, certainly the most effusive of MAP's backers but a voice to heed nonetheless, sees the efficiencies that will result from compatibility as a boon to American industry. "MAP is going to allow us to do our automation inexpensively and quickly and to change it easily," he explains. "It's going to really enhance our viability as manufacturing country."

The role that MIS can play in making this happen is hard to exaggerate, and many MIS managers are seeking out information about how the whole MAP scheme fits together.

Visitors to the Autofact '86 trade show in Detroit last November had a chance to see the first working MAP installation. A joint effort between Boeing Computer Services Co. and GM, the demonstration included equipment from 25 different vendors using MAP 2.1 specifications. Equipment was installed at 14 different sites on the trade show floor.

The demonstration used a variation on the classic tower of Hanoi puzzle, in which a stack of rings must be transferred from one peg to another, using a third peg for temporary storage. The problem is that only one ring may be moved at a time, and no ring may ever be placed on top of a smaller one.

The show demonstration used rings of various sizes and colors. Spectators could go to any of 14 vendors' booths and order a custom-made tower, specifying the number, size and color of its rings. Each order was picked by a job scheduling system, placed in a queue on one of two assembly lines and handed off to a job dispatching system, which relayed instructions and status update messages to a variety of robots and programmable controllers. There were also inspection stations to check on the size of the peg holes and on the colors of the rings.

From an application standpoint, the system's performance was less than perfect, GM's Workman says, but the communications process — MAP's shining glory — worked as planned.

GM is currently sponsoring a traveling MAP road show in a 5,000 square-foot booth that contains an active MAP local-area network. It has appeared at five trade shows in the last six months and is scheduled to appear at two more exhibits: the National Machine Tool Builders Association's International Machine Tools Show in Chicago Sept. 3 to 12 and the Instrument Society of America's show in Houston Oct. 13 to 16.

At each of its outings so far, the MAP display has attracted several hundred people, further evidence of the strong future of the MAP standard and the importance of getting involved soon.

Six words that tell the story of quality service. Confirmed by the vast majority of TRW customers.*

Tough customers with high expectations for their third party maintenance and repair company.

Like the knowledge to reduce downtime for everything from mainframes to micros — and a commitment to keep the cost of maintenance and repair down.

Plus the capability to service diverse products. IBM, DEC, and dozens of other sys-

tems from single office installations through nationwide networks. Over 1,400 products in all.

If you have high expectations for your service company, call 1-800-257-7464 today. (In New Jersey, 201-575-7110, Ext. 100.)

Whatever your requirements, regardless of your expectations, we want to hear from you.

Service solutions for tomorrow. They're taking shape at a company called TRW.

TRW Customer Service
15 Law Drive
P.O. Box 2078
Fairfield, NJ 07007-2078

*Based on a national survey in which 91.7 per cent of all respondents indicated TRW was "meeting or exceeding" their service expectations.



**Nationwide Service From
A Company Called TRW**

In Depth

By MICHAEL SULLIVAN-TRAINOR

You may not have to be an expert to develop an expert system. But to capture the knowledge of key members of your organization by using current expert systems shells, you have to come awfully close.

That is what Department of Energy (DOE) researchers at the Oak Ridge National Laboratory in Oak Ridge, Tenn., discovered when developing one of the first expert systems applications for the government's budget process.

Created for the Naval Sea Systems Command (Navsea) of the U.S. Navy, the prototype expert system mimics the decision-making capabilities of critical budget analysts. The need for such a system is vital at Navsea's Facility Management Directorate, Appropriated Funds/Budget Coordination Branch, where the eight budget analysts are being asked to take on additional responsibilities without an increase in personnel.

Ideally, the system will act as a decision aid to the analysts, helping them to be more productive. It will also preserve the analysts' expertise by recording the decision-making process of staff members with many years of experience. That way, the expertise will not evaporate when the employees retire.

PC-based system

The expert system — called Bans (for Budget Analysts) — operates on IBM Personal Computers, which are used by each of the analysts. Developed using Rutgers University's domain-independent expert system shell called Expert, Bans will be tested during the Navy's next budgeting process later this year.

The prototype was developed on a Digital Equipment Corp. VAX-11/780 by DOE researchers, and the PC version was later designed by Applied Management Sciences, Inc. of Silver Springs, Md., using Teknowledge, Inc.'s expert system skeleton, M.1.

Sullivan-Trainor is a senior writer for Computerworld.

Case History

U.S. Navy:

Knowledge base harvests expertise of budgeters

At the Navsea budgeting branch, analysts manage and control the major aspects of budget preparation, submission and execution for a group of 28 activities in the areas of operations and maintenance, weapons procurement and other procurement. They share management of the accounts of each of the activities, which include shipyards, shipbuilding and inactive ship maintenance. The analysts' levels of responsibility range from funds administration to complete program management.

Each year, the analysts must review several thousand pages of budget requests, identify areas with increases

over last year's budget lines and provide justifications for those increases — all within a two-week period.

As funding levels change throughout the year, the analysts must decide on budget allocations and reallocations as well as review each activity's performance, comparing it with a control budget.

Originally sorted and filed manually, the requests are currently stored in a data base and accessed by the analysts on their PCs. While this process gets the job done, an expert system tied to the data base will allow analysts to work more quickly.

In fact, in an initial test of the prototype, Bans took 15 minutes to run through a budget analysis that normal-

ly takes two to three hours for an analyst to perform.

DOE researchers chose Expert to develop Bans because the shell was designed for classification problems and could be adapted to the budget categories examined by Navsea's analysts.

The design of Expert was influenced by Casnet, a medical system used to diagnose glaucoma. The tool was developed by Sholom Weiss and Casimir Kulikowski at Rutgers University in the late 1970s and has been used by them in a variety of applications including oil well log analysis, computer fault diagnosis and medical diagnosis.

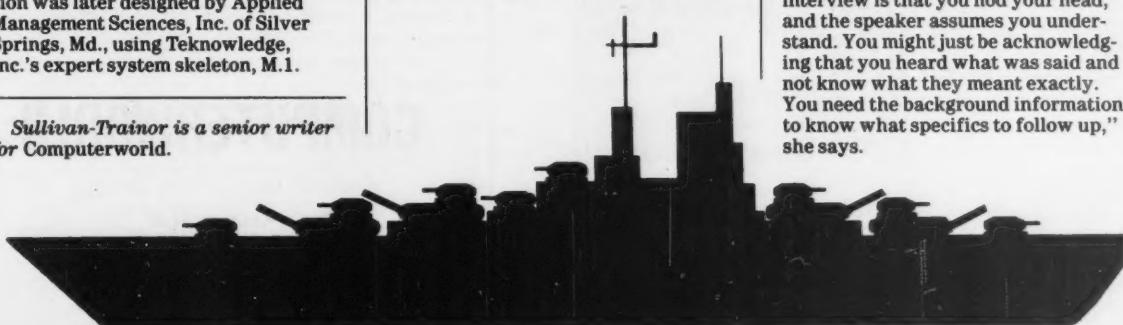
Greatest challenge: digging

Expert requires relatively little technical capability to use and leaves the collecting and quantifying of the experts' knowledge as the greatest challenge.

According to the DOE's Mary Emrich, the primary researcher for the project, "You don't become an expert yourself necessarily, but you become very knowledgeable about the tools, the topic and the people involved. That includes a lot of things like how they operate and how they approach problems."

Before approaching any of the analysts, Emrich spent a month researching the budgeting branch, digging into decision-making procedures and reading about the results of the analysts' work.

"If you don't do your homework and know the experts' terminology, you won't know whether something is a problem or not. What happens in an interview is that you nod your head, and the speaker assumes you understand. You might just be acknowledging that you heard what was said and not know what they meant exactly. You need the background information to know what specifics to follow up," she says.



"In recruitment, the bottom line is results - and that's what you get from Computerworld."



*Janet Thompson
Management Supervisor
Bozell, Jacobs.
Kenyon & Eckhardt, Inc.*

For over 10 years, Computerworld has been a primary recommendation of Janet Thompson, Management Supervisor for Bozell, Jacobs, Kenyon & Eckhardt, when it comes to recruiting data processing professionals. How did such a long relationship evolve?

"Computerworld has proven itself to be the leader in terms of quality response and value for our clients' advertising dollar. In recruitment, the bottom line is results and that's what you get from Computerworld," according to Janet.

"In a tradebook campaign for systems professionals, Computerworld outpulled the other books four to one. We're not only talking quantity, but also quality and the most hires." Janet continued. "One of our key accounts traditionally uses newsprint. But they make an exception when it comes to the data processing field. They use Computerworld on a regular basis because of its excellent cost-per-hire results."

The recruitment staff of Bozell, Jacobs, Kenyon & Eckhardt has over 65 years experience in recruitment advertising. And they all share Janet's feeling. *"It's unanimous here. Computerworld is recognized as an essential medium for recruiting in the data processing arena. And it will continue to be a primary recommendation in the future."*

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Janet.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

 A PUBLICATION OF
CW COMMUNICATIONS

To collect the information required for Bans, Emrich conducted a series of interviews with the more cooperative analysts. Engaging in an interactive process of "diplomatic nit-picking," Emrich pursued the trails of knowledge that stand behind the decisions each analyst makes, and she learned a lot about human behavior.

"Some of the analysts were quick to understand what I wanted, but others needed time to respond. You need to be cognizant of the personality types and how they might react. It's important to choose experts who can readily verbalize what they do," she says.

Being careful to allay fears that the staff would be replaced by a computer system, Emrich explained to the analysts that the expert system was being developed to aid in their decision making and reduce their work load. In addition, she was careful not to challenge their methods of reasoning.

"You don't want to question their authority or make them feel that they have to come up with a hundred thousand reasons why they do something," she adds.

Constructing Bans using Expert required Emrich to code the decision-making procedures of Navsea's budget analysts in the form of a Fortran program. This was accomplished with the help of system prompts on different levels.

For example, Emrich would input the hypotheses, and the system would instruct her to input the taxonomies that go with that hypotheses, as well as the appropriate conclusions.

"It involves breaking down the problem-solving methods that the analysts use and putting them into computer code. You fill in the hypotheses and conclusions, as well as other findings," she says.

Speaking of her work with the shell on a VAX, she notes, "It's not as sophisticated or user-friendly as some of the other tools that have just come out, especially the personal computer-based tools. It's much more than filling in the blanks. The system gives you the format that it needs, and you have to decide how to go about it."

Coding intuitive decisions

Emrich's quest for the analysts' knowledge was hampered by the heavy work schedule of each analyst and by the lack of clarity some of the analysts used in stating their own reasons for approving requests. For example, one analyst startled Emrich when she gave this response to a question: "It kind of depends on how I feel that day."

Further digging revealed that her "how I feel" amounted to intuitive decision making based on years of experience, not arbitrary decision making based on her mood.

This analyst was able to draw on such factors as the history of the purchasing activity and the spending record of the organization making the request. These factors were known to the analyst but not immediately available to anyone else. What appeared at first to be intangible could, it turned out, be coded, given the right information.

Often, Emrich found, the analysts would simply "know" whether certain requests were in line with current inflation rates and personnel levels. They knew whether a certain

“

Constructing Bans using Expert required Emrich to code the decision-making procedures of Navsea's budget analysts in the form of a Fortran program.



AT&T IS IN HIGH TECH.

INTRODUCING AT&T INTERNATIONAL SKYNET® SERVICE.

Just like in the U.S., International SKYNET is a high quality, high capacity private line service that uses satellites to transmit virtually any kind of information.

It's perfect for companies that require high performance transmission. And AT&T can provide you with your own satellite dish or give you access to a secure, shared earth station that has full redundancy.

SKYNET also offers you a full range of bit stream rates, from 56 Kbps to 1.544 Mbps for single or multiplexed one-way or full-duplex transmission. It can handle voice, data, graphics, facsimile or video. And its flexibility allows it to be tailored to the specific needs of your company's business.

Finally, as a pioneer in the development of communication satellites, AT&T is expertly equipped



to ensure your trouble-free implementation of SKYNET Service. And, once it's installed, AT&T provides 24-hour observation of the system to ensure trouble-free functioning.

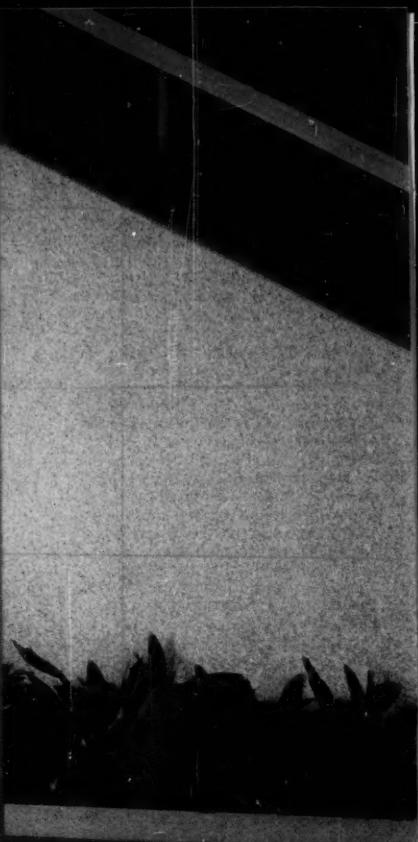
AT&T Offering a wide range of innovative, cost-efficient services to suit your business needs. Services like AT&T International Private Line Service, AT&T International ACCUNET® Reserved 1.5 Service, as well as AT&T International Long Distance Service and AT&T International 800 Service. Each one has a distinct advantage that can help you maintain a technological edge. And help you move up in the world.

To learn more about SKYNET and AT&T's other state-of-the-art telecommunications services, please contact your Account Executive at AT&T now. Or call a Sales Specialist at the toll-free number below.

1 800 222-0400 Ext. 60

AT&T
The right choice.

SALES
FINANCE
ADMINISTRATION
PURCHASING
HUMAN RESOURCES
MARKETING
MANUFACTURING
ENGINEERING



So the CIO asked,
“How do I get departmental systems
that keep everyone happy?
Including me”



And we said, “That’s our department.”

With Honeywell's ONE (Office Network Exchange) PLUS Departmental Systems, computer pros and department heads together can make fully integrated departmental computing a reality. At the same time you can protect—even enhance—your present investment in WANG and IBM systems. Because ONE PLUS's communications capabilities can tie them together. It also supports IBM's SNA. Honeywell's ISO-based DSA. Ethernet. MAP and TOP protocols. DMI interfaces to AT&T PBX's.

Much more than communications, ONE PLUS provides business applications like office and data processing. Transaction Processing. Business Graphics. Electronic Mail. Document Translation. Plus access to islands of computing through data base tools such as ORACLE** and ONEbase.

Through ONE PLUS's unique document translator, all your systems can share information in their native format: Users can create, revise and transfer files among IBM and compatible PCs using Multimate and Wordstar; IBM systems using Displaywrite; WANG OIS systems; and Honeywell.

The heart of ONE PLUS is Honeywell's new DPS 6 PLUS family of 32-bit virtual memory superminis. With shadow processing and tightly coupled multiprocessor architecture, these systems are more than a match for IBM's System 36, Data General's Eclipse MV, and Digital's VAX.

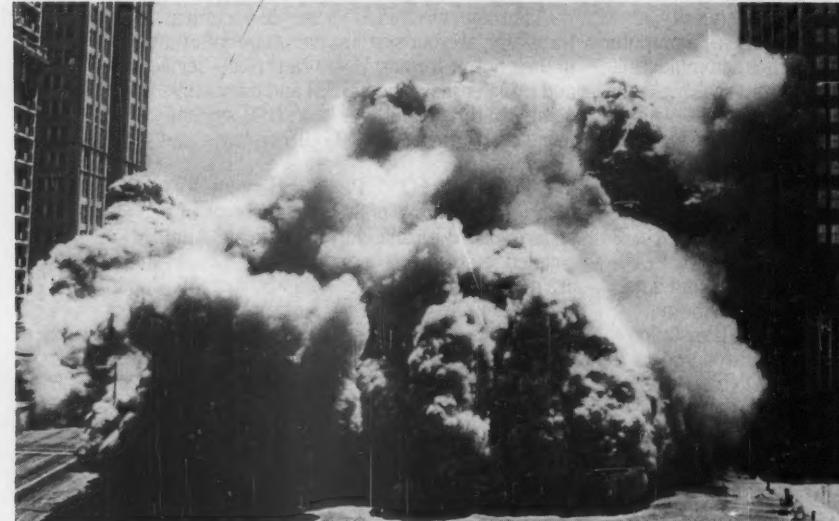
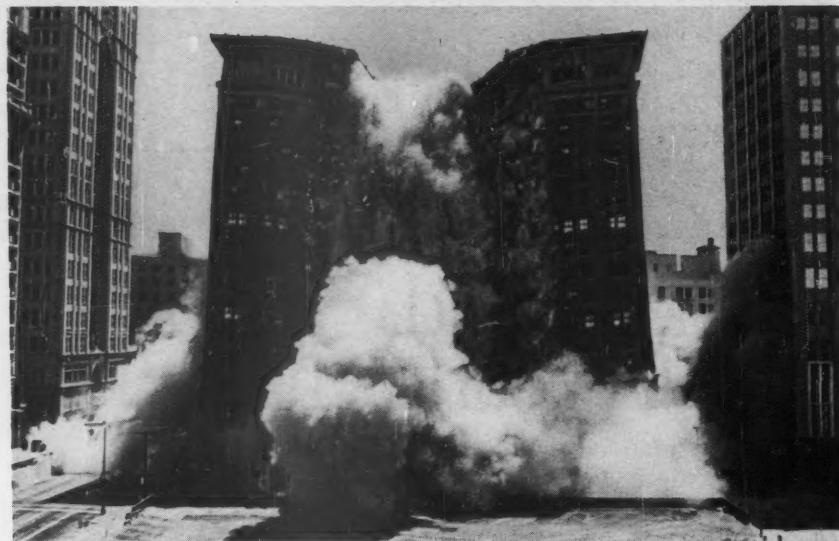
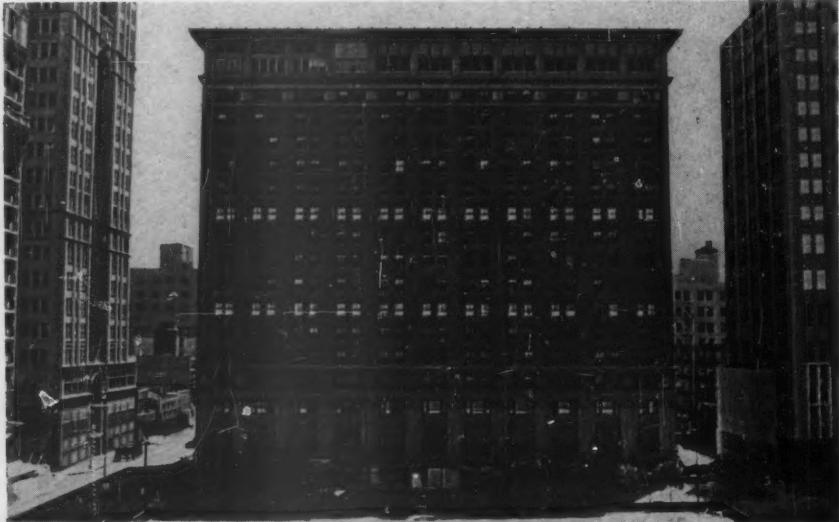
For more information, call 1-800-328-5111, ext. 9712 or write Honeywell Information Systems, MS440, 200 Smith Street, Waltham, MA 02154.

Together, we can find the answers.

Honeywell

*Oracle is a registered trademark of Oracle Corporation, Menlo Park, CA.

Some factory management systems require that your company make a few alterations.



Putting in a factory management information system can be a devastating experience.

But there is one system that lets you gain control of your whole company. Without ripping apart your whole company.

MANMAN, from ASK Computer Systems.

It's fully integrated.

So every time you implement a new function, you won't have to drastically alter the system. Or drastically alter your business to suit the system.

It's comprehensive.

So you won't have to start from scratch because the system couldn't cover all your needs.

MANMAN can cover a lot more than this ad can cover.

Its 18 integrated products let you easily control and coordinate all your Manufacturing Resource Planning.

All your inventory.

All your production management.

All your payroll. All your field service.

All told, hundreds of tasks throughout the company, all linked by an interactive information system.

All of which you can put in place at your own pace.

Because **MANMAN**'s modular design lets you implement only those functions you really need. And adapt each function to your unique requirements, using the system's built-in "business policy variables."

So no matter how you go about your business, **MANMAN** can accommodate you.

Now. And 20 years from now.

Because we continually enhance the system. And expand it, with new products like Repetitive Manufacturing, Quality Management and Service Management. And support it, with a complete customer education program.

But then customers have been educating us for over 10 years. Helping us develop a more effective manufacturing management solution.

Call 800-4-FACTORY for details.

We'll show you how you can tie all the information in your factory together.

And still keep your factory together.

ASK

Making
factory management
manageable

Expert shell captures U.S. Army regulations

By AMY SOMMERFELD FIORE

As little as two years ago, no one at the U.S. Army Logistics Center in Fort Lee, Va., had ever worked with artificial intelligence. Now, their Personnel Requirements Knowledge System, known as PERKS, is almost ready to help Army force designers determine how many support personnel are required in new units.

PERKS is being built by a team of six programmers and operations research analysts who brought no AI training to the project. "There are two schools of thought," explains William "Ollie" Hedgepeth, the Logistics Center's AI program manager. "We're following the school of thought that takes a computer expert and lets him learn enough about the expert's work processes to develop a system. Some organizations train the expert in how to develop his own system, but that's not our philosophy."

The Army sought to cultivate AI expertise in-house. In September 1984, the Army's vice-chief of staff directed the Logistics Center to look into the feasibility of tying AI to relational data base management via a natural language query system. "We really just wanted to see if we could do it, see what AI was all about," Hedgepeth says.

The result, a year later, was the first system ever to link the Ingres relational data base from Relational Technology, Inc. to LISP and Digital Equipment Corp.'s OPS language. "That was our major accomplishment the first year," Hedgepeth says. "We proved that we could do it."

After that came a list of applications projects to evaluate as possible expert or knowledge-based systems. The personnel application that became PERKS fit the criteria nicely: Decision-making rules were already set down in writing, and expert analysts worked nearby, facilitating quick consultations.

The basic information for PERKS came from *Army Regulation 570-2, Manpower Requirements Criteria*. So far, the team has created a 125-rule knowledge base that governs the personnel requirements for the quartermaster and

Fiore is a Computerworld associate editor.

supply services chapter of *AR 570-2*. The team has another 11 chapters of the manual to go before the project is finished.

Pat Jones, AI team leader at the Logistics Center, explains, "PERKS is designed to help the logistics analysts here, who use this regulation to define the personnel requirements for different military organizations that need certain types of clerks or fuel handlers or food supply personnel — about 18 kinds of personnel."

"The key thing," she continues, "is that PERKS applies the reg the same way every time. If the user is tired or comes in one morning and doesn't feel well and he has to design a new unit, as long as he picks the right things on the PERKS menu, he'll get the right answer."

The knowledge-based system will help keep decisions consistent. "You're talking about quality control of military logistics analysis," Hedgepeth says. The Logistics Center does not intend to replace any staff members with the system but hopes the added productivity will allow workers to tackle projects not currently being done. The system will also be used for training.

The Logistics Center chose the Symbolics, Inc. 3640 computer, a single-user system with a high-resolution monitor. Developers started with the center's DEC VAX-11/780 for the initial AI data retrieval system but found the VAX, saturated with other users, demonstrated slow response times.

The AI team purchased Intellicorp's Knowledge Engineering Environment (KEE) software because of its versatility and sophisticated user interface. The KEE System provides both forward and backward chaining on rules and inference structure.

KEE's accessible user interface suited the inexperienced AI team. "The AI languages we used in the first project were a nightmare. KEE is relatively easier to learn," Hedgepeth says. Two team members took a one-week course about KEE. "Within two weeks, they had 40 rules in a prototype system, and it looked great," he adds.

The AI team has faced some serious obstacles, however. For one thing, the limitation of relying on a single-user system slowed development un-

expectedly. Moreover, KEE's user interface turned out to have its drawbacks.

"The interface, which involves the use of icon images, is very flashy," Jones explains. "But we needed more information on the screen at one time than KEE would allow." The AI team tried to circumvent the icons, but the software proved resistant to their attempts. "In the present version of KEE, there seems to be no way to do what we want to do. It will be a matter of working around the KEE images," Jones says.

Short but frequent sessions with the functional expert proved critical to developing a useful system. "Army regulations often have rules that aren't clearly defined," Jones says. "The words may have multiple interpretations so the users will have some leeway." PERKS now contains extra subdivisions of some rules, with clarifications supplied by the expert user. The expert also suggested creating an automated history of user suggestions for rule additions or changes. The final version of this chapter, due later this month, will include more than 200 rules.

The Army uses other knowledge-based systems for maintenance, diagnostics and planning, but few have been developed exclusively by Army staff members. Says Jones, "What we may be proudest of is that we've shown the skeptics you don't have to be a Ph.D. in artificial intelligence or spend millions of dollars hiring an outside contractor to develop a sound, reputable product."

— Pat Jones
Army Logistics Center

"We've shown the skeptics you don't have to be a Ph.D. in AI or spend millions of dollars on an outside contractor to develop a sound, reputable product."

The team's work will remain unclassified. "We are very open-door here," Hedgepeth says. "We're doing technology transfer big-time both inside and outside the Army. Our commanding general is very communications-oriented."

Projects now on the slate favor the Logistics Center, but over the next five years, Hedgepeth says, given available technology and low-cost delivery vehicles such as the Xerox Corp. 1185, they may begin AI projects for other organizations. "Our early success cascaded into a production-type environment where our charter was about 90% rewritten to look at AI developments only," Hedgepeth says.

utility increase was justified, based on current rate hikes, or whether new construction was appropriate for the requesting site.

"You have to dig out the specific reasons that one request was approved and another disapproved. You need to quantify them somehow, have them verbalized or put them in writing. Sometimes it's very difficult for an expert to put into words what he's thinking or talk about what he's done so often each day," Emrich says.

The only way to reach that essential information is through persistent questioning and probing. According to Emrich, "You have to go back and rethink the questions that you asked. Are you getting the responses you wanted?"

Writing the rules

This trial-and-error interviewing process became the basis for the procedures programmed into Bans. After the system designer input the experts' knowledge and heuristics, these were repre-

sented by the shell in the form of production (if-then) rules. Emrich then had to make judgment calls to determine which rules to include in the system.

In building Bans, Emrich began by using Expert's editor to create the file of rules, which she compiled. The compiled version is executed when the system is operating.

Each decision-making model has three major sections:

- Hypotheses.
- Findings.
- Decision rules relating the findings and hypotheses.

In operating the system, an end user chooses from a list of possible findings that are appropriate for the specific interaction, and then — using the decision rules — the system infers and outputs the appropriate hypotheses.

The findings section represents the input for the decision: the initial determination of the problem and a listing of questions and answers. Hypotheses are the

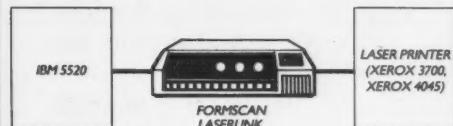
available conclusions the system can reach. The decision rules input by the system designer link the two.

Each rule can have a weighted value or confidence factor assigned to it by the system designer. By giving a weighted value to the importance of the rule relative to other rules and/or to the solution at hand, the system codifies the expert's uncertainty. This, in turn, lets the end user know to what extent he can rely on the conclusion.

A Bans session works in the following way:

In an interactive consultation mode, an end user may be faced with a decision regarding a department's report of insufficient funds. Bans queries the user and develops specific findings for a given problem based on the end user's responses to several types of questions: multiple choice, numerical, yes/no and checklists. Questions are grouped in questionnaires, which arrange the questions in the order to be considered. This allows

Happiness is a Xerox Laser Printer on an IBM 5520.



Why let your IBM 5210 printer slow you down? You could now be printing as fast as a new Xerox printer will let you.

FormScan's LaserLink connects the new printer to your IBM 5520 and you're in business! There's no swapping of daisy wheels for font changes and set up routines remain the same—it's just the standard of presentation that changes!

Call John Harvey on 516 752 0032 for full details.

FORMSCAN

FormScan Inc., One Huntington Quadrangle, Suite 2C10, Melville, New York 11747.
Cetec and FormScan are the registered trade marks of FormScan Corp. IBM is the registered trade mark of IBM Corp.
Xerox is the registered trade mark of Xerox Corp.

for rule re-evaluation, if necessary, after each response.

In this case, Bans asks for the type of problem, and the user responds that it is a financial problem. Bans asks whether the problem involves surplus funds, a request for new funds or another financial problem.

The user then selects the nature of the problem, its priority level and a number identifying the type of activity involved. The user also responds to Bans' requests for information on the availability of funds for the activity, whether the Navsea master budget currently shows a surplus and whether the activity in question has a good track record.

Bans summarizes the results of the interaction and states conclusions accompanied by a confidence level. Conclusions come in the form

" *While the expert system has already proved to work faster than the analysts, the goal is for greater consistency in decision making, and further enhancements must be made to reach that objective. Says Emrich, 'From the beginning, the outputs were very close to what the experts were doing.'*

of a diagnosis and a recommended treatment. With the diagnosis, "give more funds to the activity," the treatment options are "transfer funds," "give more consideration" or "deny the request."

In this example, the end user fills in findings consisting of a good record of spending by that department and a high priority for the project

because it is considered critical. These findings lead to the hypothesis that more funds should be granted with a very high certainty factor.

Yes, no, maybe

In a case involving a budget submission from an activity with a poor track record, Bans responds by indicating that there is only a 50-50

chance that the request for additional funding should be approved. Instead, Bans recommends, the request should be looked into further, which may require supplemental information, such as a letter of justification. Letters like these can be initiated by Bans, along with a memorandum to the directorate detailing the action.

In another case, an end user answers that the problem is financial — there are insufficient funds within the activity's budget — but the master budget shows a surplus. In this case, the conclusion might again be to grant additional funds but with a lower certainty factor.

Bans also allows the user to retrieve the list of rules on which it based its conclusions. By typing "why," the user can view Bans' line of reasoning in a forward chaining format. Functional findings may be listed at the end of the findings section, where mathematical operations, such as ratios between numerical findings, may be defined.

Certainty factors were assigned based on judgment calls that Emrich made based on her interviews with the analysts. The formal, accurate certainty factors will not be developed until the system is tested this year and the frequency of certain decisions can be assessed. This area of certainty is under study by the DOE's artificial intelligence research group, and the results will help determine a formal methodology for assigning such confidence factors.

Besides resolving financial queries, Bans can answer questions regarding the nature of ship maintenance or personnel control activities. For example, the system could address a problem involving the inactivation, preservation or maintenance of a particular ship.

Fine-tuning for accuracy

After the prototypes for Bans were constructed, the analysts and their supervisor examined the system to determine its accuracy.

"In general, they determined that Bans had captured the ideas and methods of the analysts," Emrich says. "They said, 'This is what I do, but it's not exactly the way I do it.'"

Faced with this response, the agency began fine-tuning Bans to reflect more closely the analysts' reasoning process and to increase the system's accessibility through improved user interfaces.

While the system has already proved to work faster than the analysts, the goal is for greater consistency in decision making, and further enhancements must be made to reach that objective.

"From the beginning, the outputs were very close to what the experts were doing," Emrich says.

One enhancement will be the addition of a formalized budget request submissions format that will present Bans with consistent information about an activity. Currently, the requests are often submitted incomplete and in different formats.

Though it will be tested on some of the budget requests this fall, Bans has not reached the point at which it will be used on its own, as a complement to the current staff of analysts. Instead, the system will analyze the same problems that a particular analyst handles, and the two results will be compared. The system is expected to be fully operational as a decision support tool for the analysts in the fall of 1987.

Pocket the potentials of desktop publishing at COMDEX/Fall.



This year, COMDEX/Fall spotlights a technology that offers resellers and vendors of desktop publishing products and services vast new business opportunities.

For vendors, desktop publishing at COMDEX draws the tens of thousands of

resellers you need to reach a global market. And resellers can find the vendors who sell the hot new hardware, software, and systems products they need for their customers.

At the COMDEX/Fall Desktop Publishing seminar, an exclusive one-day offering, resellers will discover how to capitalize on the monumental business opportunities of this dynamic technology. See why desktop publishing will grow into a multi-billion dollar industry in the next five years. And explore the technology itself.

Pocket the potentials of desktop publishing November 10-14. And set aside November 13 for the special one-day desktop publishing seminar. For more details, send in the coupon now!

Put desktop publishing in my pocket!

- Send me complete exhibiting information.
- Send me complete registration information.
- I plan to attend the Desktop Publishing seminar

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Return to: David Thurman, COMDEX/Fall '86
300 First Avenue, Needham, MA 02194

COMDEX/Fall '86

Join The Winner's Circle
November 10-14, 1986, Las Vegas, Nevada

MANAGEMENT



TAKING CHARGE

Ross Perot

Success in business

The following speech, delivered to the Junior Chamber of Commerce in Grand Rapids, Mich., reflects Perot's overall management philosophy.

First, let us talk about what success really is.

Success is doing something you enjoy and doing it well. The teacher, minister, elected official, military officer or missionary who is tops in his or her field is every bit as successful as the person who makes a great deal of money. The best way to measure success is in terms of personal accomplishment and personal satisfaction.

As a young person looking ahead to your career, the most important thing you can do is to be honest with yourself. Nobody else can know you as well as you know yourself. Certainly, no personnel director or recruiter can figure out what you really ought to do as well as you can.

Unfortunately, too many people have stereotyped opinions about what they ought to try to become, and they let these override what they really want to be.

My advice is simple: Size yourself up. Figure out your strengths and weaknesses. Plan a career that centers around your strengths, not your weaknesses. Commit yourself to that career. Learn to do whatever it is you set out to do better than anyone else.

Probably the most important advice I can give to a group of young people is to remember that life is not orderly. In

See **SUCCESS** page 64

Perot is founder and chairman of Electronic Data Systems Corp.

TAKING CHARGE

Ross Perot

Federated invests in PC ATs

Replacement of terminals aimed at speeding trades

By David A. Ludlum

PITTSBURGH — In a two-pronged thrust, Federated Investors, Inc. is revamping the on-line system that institutional investors use to buy and sell its mutual funds.

By replacing dumb terminals with personal computers and rewriting software, Federated aims to make the network more flexible and easier to use, company officials say. Roughly 1,500 bank trust departments and other money managers nationwide use the system.

Federated, which manages nearly \$2 billion in assets, is in the midst of replacing Digital Equipment Corp. LA-34 terminals used in the Tandem Computers, Inc.-based system with IBM Personal Computer ATs and rewriting part of the system software.

That should reduce the transmission time and effort required for clients to



Paul Angell

make transactions, according to Paul Angell, a Federated vice-president and the firm's director of data processing.

Angell says Federated is rewriting the back end of the software to accommodate the changes but leaving users' procedures intact. "We wanted to make sure we didn't cause any confusion at the bank level," he adds.

The ATs with the new software validate the client's transaction themselves, rather than relying on the mainframe at Federated's headquarters, and transmit orders at 1,200 bit/sec. rather than 300 bit/sec., according to Angell.

The new system also avoids the need for users to key in numbers to identify their bank, the fund they are trading and their account, requiring only menu selections, a dollar amount and indication of whether the transaction is a buy or a sell, he says.

"With the PC [AT] we have the intelligence in the field to be able to do that. That is a major improvement to our world.

See **FEDERATED** page 65

INSIDE

Calendar: Selected shows, conferences and exhibitions/67

INSTANT ANALYSIS

"The users are the revenue producers within the corporation. It is MIS's role to serve them."

— Herb Halbrecht, president of Halbrecht Associates, Inc., Stamford, Conn.

Businesses eye checkout scanner data to determine pricing, promotion plans

By David A. Ludlum

Interest on the part of supermarket chains, consumer products makers and advertising agencies underscores the increasing attention being paid to data gleaned from scanners at supermarket checkout counters.

The heightened interest in the data stems from both intensifying competition for consumer dollars and advances in computer and scanner technology. Where stores once used the numbers chiefly to keep shelves stocked, manufacturers and retailers now pore over them in determining their pricing, promotion, allocation of shelf space and which brands they will sell.

"What began as a revolution in inventory control is now becoming one in management, because the quality of the data is there," says Lee Cooper, an associate professor at the University of California at Los Angeles (UCLA) Graduate School of Management.

Cooper is working on analysis of scanner data for consumer products giant Procter and Gamble Co., as are other academics at the University of Chicago and the University of Texas.

Procter and Gamble is characteristically mum on its interest in scanner data. One source familiar with the work says officials of the company are under a gag order

See **BUSINESSES** page 65

MANAGEMENT MEMO

McDonald's menu goes on-line; VDTs said to slow reading

Joining the trend toward capturing point-of-sale data (see story this page), McDonald's Corp. has put terminals at a number of its fast food outlets on-line.

Lana Erhsam, a spokeswoman for McDonald's, confirmed the company is testing the concept but declined to provide details. "We are looking into it. We're not ready to talk about it now," Erhsam said. She added that the company is undertaking the experiment "to make it easier for managers to conduct business or make things flow more smoothly in the restaurants."

■
Reading from computer screens is more difficult than reading from

paper despite improvements in screen design, according to researchers at The American Institutes for Research in Washington, D.C.

The relative difficulty of reading computer screens may make finding typographic errors harder and make solving problems take longer, even when users prefer screens, according to Carol Mills, director of the institute's Usability Test Laboratory.

Researchers say they are not sure why reading from screens is more difficult. Practice does not seem to make the difference; people reading from screens all day still do better with paper, according to John D. Gould of IBM's Thomas J. Watson Research Center.

Mills says software developers must recognize the importance of designing screens for readability. For easier reading on screens, she suggests a combination of upper case and lower case letters, ragged right margins and double spacing.

This fall, the Rochester Institute of Technology launches an undergraduate program to train students to communicate effectively about complex technology. A statement from the school says the program is "driven by the growing need for professionals who can translate technology into plain English."

Students in the program will learn the theory and practice of spoken,

written and visual communication while pursuing one of the school's professional or technical programs in business, computer science, printing, photography or science.

The university foresees graduates following careers in fields such as technical writing, editing, marketing, communications training, mass media and public relations.

"The shortage of professionals who can speak, write and think clearly has been identified as a severe managerial problem," said Bruce Austin, chairman of the program. "This program relates to everyone who has ever experienced the frustration of following 'simple' directions that don't make sense."

MANAGEMENT

Success in business

From page 63

many cases, life is not logical. Business and life do not follow the neat lines of an organization chart. Both business and life are far more like a cobweb. As you commit yourself to a business career, remain flexible, realizing that the more you learn about a business, the keener your insight will become about what you really want to do.

Don't ever lose the traits you had as a child. As a child, you were totally comfortable in deciding one day to be a teacher; the next, a professional athlete; and without any hesitation, to change to a brain surgeon, plumber, lawyer, jockey or whatever else suited your fancy. Unfortunately, after you became an adult, you acquired a strong need to be consistent.

Within our company, I occasionally encounter great young people who, based on their initial knowledge of EDS [Electronic Data Systems Corp.], selected a position in our business. Over a period of time, they realized they would be better suited in another area of EDS. They never discussed it, feeling that EDS had poured a great deal of money into training them, and, having committed themselves to a job, they felt they should stick with it.

The end result is that at some point in time, these people come in terribly disturbed. In most cases, they feel EDS should have intuitively sensed those things they were never willing to discuss with anyone.

We work very hard in EDS to keep a climate that allows each person the personal freedom to choose a different career path, based on additional knowledge and experience.

If you have made a mistake in your career choice, talk to the people in your company. Tell them what you want to do. The more successful you are, the more successful your company becomes.

The steps to success

How does a young person become successful? Here are some simple steps:

- Pick an industry that attracts you.
- Pick the company in the industry that has the greatest appeal to you. Until you find something that you just couldn't stand not being a part of, keep looking.
- Serve an apprenticeship in that company. Learn all about it and the industry — become an expert.
- Look for unmet needs. Look for markets that are not being satisfied.
- Develop ideas to satisfy these needs. Present these ideas to your company. If the idea is sound and your company is sensitive and alert, you will have an opportunity to turn your idea into reality.

In my case, the company I was working for was not interested in the idea I developed. I decided to start my own business because I was convinced that my idea was sound. That idea is now EDS.

Again, though, before you branch out on your own, know yourself. In this large group here tonight, there are probably no more than two or three people who should start their own business. The failure rate of

new businesses approaches 100%. The failure of new businesses started by people who have the capability to start a new business is still extremely high because of all the pressures and stresses inherent in turning an idea into a business.

I have had a particularly unique experience in watching several thousand great young people start their business careers. Again and again, I have seen these people approach business as a hundred-yard dash. They initially had great energy, great ambition; but they poured so much energy into their efforts for a brief period of time that they were unable to produce a great, sustained performance, month in and

month out.

Never forget that a business career is a cross-country run, requiring you to produce consistently over a period of years.

Nobody has developed a course that successfully teaches young people starting out in business. Inevitably, they are going to exhaust themselves. Hopefully, they will be tough enough to survive that experience and learn to pace themselves.

As you build your career, you will have to make another decision: to develop your career along professional lines or go into management.

Unfortunately, many young men and women in business today feel

they are failures unless they go into management. My reply to these people is simple. What if Dr. DeBakey, one of the world's foremost heart surgeons, had decided to be a hospital administrator? The world would have lost a gifted heart surgeon.

In EDS, our business is the operation of huge computer centers and systems engineering. What would EDS's future be if its most skilled computer center staff and its senior-level systems engineers became managers? EDS would lose its greatness.

It takes both the professional and the generalist. Both roles are of equal importance. Don't let yourself get confused on this subject and feel that you must force yourself into management even though you really want to develop your career along professional lines.

See **SUCCESS** page 66



EDS's Perot

THE POWER.

Experience the power and glory of this full line of personal computers and printers. All from Epson, the people who brought you the industry's leading printers.

Let's start with the power. IBM® compatible power.

Epson delivers it three ways: Equity™ I, Equity™ II and Equity™ III. These three computers offer equal or better performance and more standard features than the corresponding

IBM® PC, XT™ and AT™ models. Combine this with the Equity's lower price, and you have an incomparable value.

With a highly flexible set of configurations, extra expansion slots, color and monochrome monitors, and high capacity hard disks, each Equity can be fully integrated into

your stand-alone or multi-user applications, and tailored to meet almost all your company's personal computing needs. Of course, virtually every hardware

options to satisfy even the most demanding user... with glorious results.

Which leads us to the Epson LQ-1000.

Latest on a family tree that has made Epson a printer industry leader for more than twenty years, the Epson LQ-1000 is proof that dot matrix technology can be raised to new heights of speed and resolution.

Federated invests in IBM PC ATs

From page 63

It's a strategic move as far as I am concerned," Angell explains.

Joe Gaafar, assistant trust officer at Lafayette National Bank in Lafayette, Ind., and a user of the system, concurs. "It's really helped us out quite a bit. It seems like they've been able to speed up the process as well as give us quite a bit more information," Gaafar says.

Federated began replacing terminals with PC ATs last December and now has about 1,100 in place, Angell says. He adds that he expects to have that job completed and the software rewritten by the end of this year.

The firm first went on-line with clients in 1981 with its Edge network, a forerunner to the present Federated Network. The Edge system ran on three Tandem Nonstop computers, which employ parallel processing, and the DEC terminals.

Since 1982, the number of transactions the firm handles each business day has grown from about 300 to roughly 15,000, totaling approximately \$800 million a day, according to Angell. A staff of 50 handles the transactions, most of which take place between 10:30 a.m. and noon, he says. "There would be no way you could support those transactions in a manual mode," Angell says.

Before the Edge system was in place, Federated clients called orders in to Pittsburgh by telephone, where a data entry clerk keyed them into a computer for validation. If the order

was good, the computer sent it to Federated's bank servicing agent, State Street Bank and Trust Co. of Boston.

There the order was keyed into a Federal Reserve Bank system, which transmitted cash to or from the client. If the order was not valid, the Federated operator would not know about it until hours later.

The on-line system automatically validates orders with Federated's system, providing clients with a hard-copy printout, posts them with State Street Bank and Trust and sends them to the Federal Reserve wire system.

In addition to speeding up transactions, the on-line system has cut the costs of order entry in half, Angell says. It also provides clients with information on their investments, current interest rates and Federated products.

Businesses eye scanner data

From page 63

not to speak about it.

"It's clearly of great interest [in the consumer products industry]," the source says. "You finally can track week by week, market by market, brand by brand what the effects of pricing and promotion are."

Supermarket chains are increasingly using the data captured by their scanners to assess profit on a product-by-product basis, evaluating the impact of special promotions and planning how to allocate valuable shelf space.

Some, such as Safeway Stores, Inc. of Oakland, Calif., sell the data on magnetic tape to market research firms and manufacturers. Such clients usually order data for sales of specified products, stores and weeks, says Louise Booth, Safeway's manager of scanner marketing research.

Safeway also does data processing for clients — compiling reports on sales of different brands of a product, for example — and even does test marketing itself, capturing the results with scanners.

For instance, the researcher might compare the sales of an item displayed at the end of an aisle with those of the same product bought from the shelf, identifying them with different product codes.

Safeway's sales of such data, processed by IBM mainframes that were already in-house, represent a substantial and growing source of revenue for the company, Booth says.

Before the refinement of scanner technology, the chief source of consumer spending data was bimonthly reports put out by market research firms such as A.C. Nielsen Co. and Selling Areas Marketing, Inc. (SAM), a subsidiary of Time, Inc.

Additional players

While Nielsen and SAMI have kept up with the introduction of scanners, buying data from retailers, the new technology has brought additional players into the business.

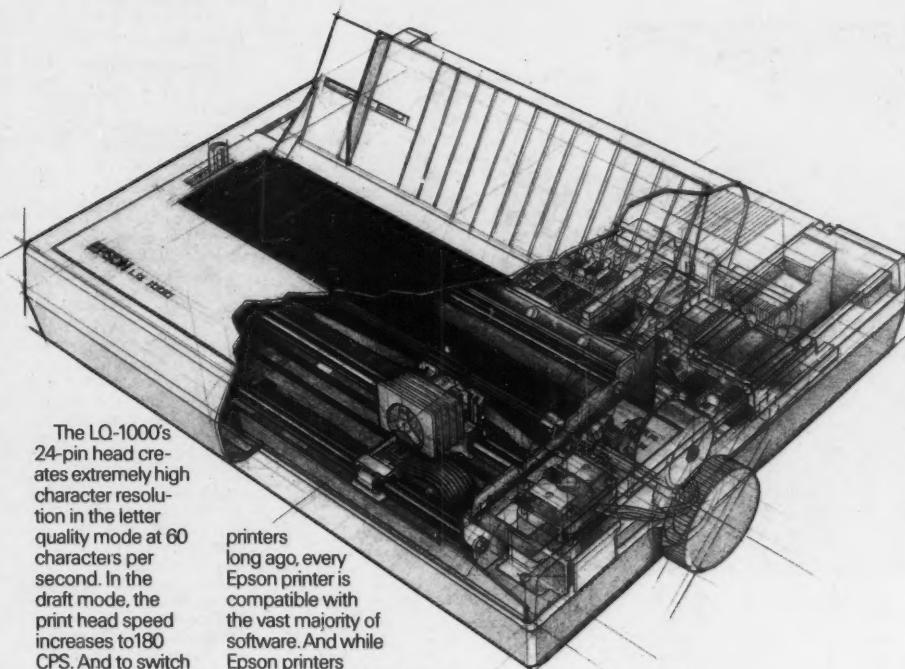
Information Resources, Inc. (IRI) of Chicago went into business in 1979 with Behaviorscan, a research service for test marketing that captured scanner data transmitted on-line from retailers in eight market areas.

This summer, IRI rolled out Infoscan, a nationwide service for tracking consumer spending at supermarkets in more than 40 markets. Its system is on-line with 120 stores and the headquarters of a half-dozen major retailers, according to Tom Daly, an Infoscan marketing representative.

Infoscan, using a data dictionary of more than 500,000 items classified by the Universal Product Code, uses mostly IBM mainframes and software but employs Express, a data base developed by IRI, for final analysis and presentation of data, says Tony MacNeary, IRI's vice-president of retail consulting.

Also this summer, Ogilvy Group, which operates one of the country's largest advertising agencies, disclosed in an in-house publication that it is on-line with a shelf space management system in New York. A spokeswoman for the company declined to comment further, saying announcements would be forthcoming.

THE GLORY.



The LQ-1000's 24-pin head creates extremely high character resolution in the letter quality mode at 60 characters per second. In the draft mode, the print head speed increases to 180 CPS. And to switch modes, you merely press a button.

Glorious output, speed and ease of use are designed into the entire line of Epson printers. A line that includes a whole range of industry-leading dot matrix machines in 24 and 9-pin formats, plus color printers and plotters.

Because we set the standard in

printers long ago, every Epson printer is compatible with the vast majority of software. And while Epson printers are the natural choice for Epson computers, they also work with every IBM PC compatible personal computer on the market.

Naturally, all this high technology would be useless if we didn't also offer high reliability. That's why our Equity computers are built to the same rigorous standards that

have made Epson printers legendary for toughness. And why we back our products with Epson's one year limited warranty.

Epson Equity personal computers and Epson printers. Tangible proof that while others may promise you power and glory, Epson delivers.

For more information about the Epson line of personal computers and printers, call (800) 421-5426, or (213) 539-9140 in California.

Epson is a registered trademark of Epson Corporation. Equity is a trademark of Epson America, Inc. IBM and AT are registered trademarks, and XT is a trademark of International Business Machines Corporation.

EPSON
C O M P U T E R S
P R I N T E R S

MANAGEMENT

Success in business

From page 64

Again, know yourself. Know your strengths and weaknesses. Play to your strengths. That's what every winning team does. That's what every very successful person in business must do.

Whether you plan to develop your career along pro-

fessional or management lines, I hope that you will learn something that I am deeply aware of: One person is nothing more than a straw in the wind. The sooner you realize how insignificant you are, the brighter your career will be.

This is an easy concept to grasp when you think of management, but it is more difficult when you think of a professional career. Again, let us use Dr. DeBakey as an example. He works with a

small but highly skilled team of doctors and nurses. Let us assume that some morning only Dr. DeBakey arrived to operate. Nothing would happen. Even though great professional is helpless without a team.

Once you start to realize your own limitations, it is only natural for you to start surrounding yourself with men and women of greater capacity than your own. Then, and only then, will exciting things start to happen.

As you build your career, you must learn to attract and keep great people as a part of your team. Finding and attracting these people is difficult. Keeping them as part of your team is the key to your future.

How do you do this? Simply by creating and keeping an environment where their goals and dreams can also materialize.

In EDS, we do a number of things to build and keep this environment. It is fragile. All

of us have to work at it very hard to keep it as the company grows. First, there is no seniority system. The best qualified person gets the top job. We constantly work to prevent company politics in EDS. We want men and women who wish to build their careers based on what they produce and who would not stoop to building their careers at the expense of others.

At EDS, we are dedicated to dealing with each person as an individual. There is only one class of employees at EDS. We do not tolerate one person looking down on another. We strongly discourage an atmosphere where one person would look up to another as a more important person, because we think that stifles free, open communication. Instead, we try to maintain an environment where each person deals with each person in our business as a full partner.

At EDS, we are dedicated to recognizing and rewarding excellence. We want to know who the top producers are. In every possible way, we want to recognize them for their unique contributions.

The most successful people

As a result of EDS's business success, I have had the opportunity to meet and get to know the men and women that you would consider among the most successful business people in the world today. I think you would be interested in knowing some of their characteristics.

First, there are no geniuses in this group. In terms of mental capacity, they would probably be ranked slightly above average. One characteristic stands out. These people are honest. They do what they say they will do. This causes other people to trust them. This creates an opportunity for these people to lead. Never forget, trust is fragile. It takes years to earn. It can be lost in an instant. It must be re-earned each time you have contact with another person.

Another characteristic of these successful people is that they have a great deal of self-discipline. They are able to stick to the task at hand. They realize that the more successful they become, the more unpleasant the tasks will be that they have to perform.

As an example, EDS has a brilliant team of men and women. All of the routine problems, and even the tough problems, are handled without my knowledge. By the time a problem gets to my desk, it has repeatedly defined solution. So, you can see that one of the "rewards" for building a successful business staffed with a great team is to earn the opportunity to spend most of

See **SUCCESS** page 69

The Preventive Medicine that Reduces System Outages by 90%. **STABILIZE/CICS**

Detects and Repairs Most CICS System Abends Instantly

The Best Medicine Cures the Problem Before It Occurs
STABILIZE/CICS is the "preventive medicine" MIS/DP installations have been waiting for. STABILIZE diagnoses critical CICS systems problems and then automatically supplies real-time corrections. Now you can get a powerful mainframe software product that will reduce your systems outages by 90 percent!

Keep Your System Up and Running
STABILIZE combines two powerful systems working in unison. The System Repair Component automatically repairs corrupt system components, while the Diagnostic Component provides on-line diagnostic information.

When problems occur, the Repair com-



ponent immediately goes into action. Functionality is restored within seconds, preventing typical 30-minute outages. At the same time, the diagnostic component displays the cause of the problem, helping your staff to prevent future occurrences of the same error. The results—STABILIZE delivers enormous productivity improvements for the people who use your CICS systems.

Key Benefits of STABILIZE:

- Continuous operation for critical business functions
- Safe, simultaneous protection for multiple CICS regions
- No impact on systems response
- Reduced risk of repeated problems
- Increased CICS programmer productivity
- Quick and easy installation
- Automatic diagnosis of error conditions

FREE 30-DAY TRIAL OFFER!

Get the prescription your CICS installation needs to increase system availability. Call us now toll-free for a FREE 30-DAY TRIAL, or for more information on our products, our courses, and our free product seminars.



On-Line Software International, Inc.

Two Executive Drive, Fort Lee, NJ 07024

1-800-526-0272

Or in New Jersey call 201-592-0009.

IBM is a registered trademark of International Business Machines.

Come see us at Info® 86, booth #748

IBM® Software Authorities

MANAGEMENT



CALENDAR

SEPTEMBER 7-13

Entity Modeling: Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Technical Update Conference — 86. Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11565 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC-Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

1986 Intelligent Buildings Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Associates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30026.

Midcon/86. Dallas, Sept. 9-11 — Contact: Midcon, 8110 Airport Blvd., Los Angeles, Calif. 90045.

Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Dataquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, 1290 Ridder Park Drive, San Jose, Calif. 95131.

Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

The Annual Policy and Planning Conference of the Electronic Funds Transfer Association. Washington, D.C., Sept. 14-16 — Contact: EFT Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20036.

CADRE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Director of Client Relations, ADR, Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

The MAP/TOP Users'

Group Meeting. Ann Arbor, Mich., Sept. 15-16 — Contact: Society of Manufacturing Engineers, Technical Activities Division, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The International Video-Text Industry Exposition and Conference. New York, Sept. 15-17 — Contact: VI Association, Suite 200, 1901 N. Fort Myer Drive, Rosslyn, Va. 22209.

Ninth National Computer Security Conference. Gaith-

ersburg, Md., Sept. 15-18 — Contact: Computer Security Conference, Attention: C421, NCSC, 9800 Savage Road, Ft. George G. Meade, Md. 20755.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Networld 86. Dallas, Sept. 16-18 — Contact: Novell, Inc., 748 North 1340 W., Orem, Utah 84057.

kee, Wis. 53215.

The Sixth Annual Conference on Control, Audit & Security of IBM Systems. Boston, Sept. 21-25 — Contact: MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

Datastorage 86. San Jose, Calif., Sept. 22-24 — Contact: Forum Management, Cartilage & Associates, Inc., Suite M250, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

See CALENDAR page 72

Everybody's Copying Our Micro-to-Mainframe Link FREE-LINK™ With Unlimited Site Licensing



As Many Copies as You Need

For the first time, you can make as many copies of our FREE-LINK micro software as your organization needs. It's no longer necessary to pay for each individual copy or to ask your vendor to authorize additional copies. We've already taken care of that for you. A renewable yearly license for our mainframe software lets you link as many users to the mainframe as you want, at no additional cost. We've even included free maintenance as well as continuous software updates.

The Leader in Link Software from the Beginning

FREE-LINK is the most talked about micro-to-mainframe link in the industry. Since its introduction, over 600 users have found FREE-LINK easy to use and adaptable to their specific

needs. FREE-LINK has created a new generation of link users—people who were looking for an inexpensive, no risk way of addressing their organizations' micro-to-mainframe link needs.

Powerful, Practical Software

FREE-LINK is powerful, practical software. Now users can take full advantage of their PCs by accessing mainframe data quickly and in a format that's ready to use. With a single keystroke, FREE-LINK users can download and

reformat mainframe VSAM files for insertion into popular PC software like Lotus® 1-2-3™ and dBASE II®/III™. FREE-LINK's menus and help facilities make this link incredibly easy to use. Best of all, FREE-LINK installs in just hours.

On-Line Software—A Name that Means Expertise

On-Line Software wants to share its expertise as a software developer, educator, and consultant with you. Ask about our free seminars in major cities nationwide. We've even written a booklet, *Micro-to-Mainframe Links—Separating State of the Art from State of Confusion*. For your free copy, call Ms. Bernie Burke toll-free at (800) 526-0272. Everybody's copying our micro-to-mainframe link, and you should too!

Call us now for more information on our products, courses, seminars, and our free booklet.

On-Line Software International, Inc.

Two Executive Drive, Fort Lee, NJ 07024

1-800-526-0272

Or in New Jersey call 201-592-0009.

IBM is a registered trademark of International Business Machines. dBASE II/III are trademarks of Ashton-Tate. Lotus 1-2-3 is a registered trademark of Lotus Development Corp.

Come see us at Info® 86, booth #748

IBM® Software Authorities

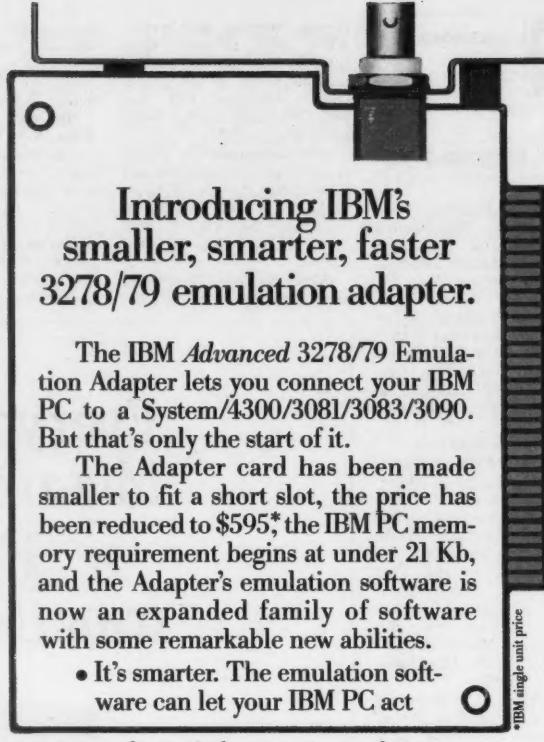


Introducing IBM's smarter, snazzier, worldlier 5250 emulation adapter.

The IBM Enhanced 5250 Emulation Adapter lets you connect your IBM Personal Computer to a System/34/36/38. But that's only the start of it.

The Adapter's emulation software has been enhanced to allow for some remarkable new feats.

- It's smarter. Now you can run two System/34/36/38 sessions plus one PC program simultaneously (switching between them all just takes a simple hot key sequence).
- It's snazzier. If your PC has a color monitor, now you can use the Adapter to interact with your system's Business Graphics Utility Program and print your session on the system's plotter.
- It's worldlier. If your PC has a modem and an SDLC adapter, now you can use the Remote Emulation Program to interact with a System/36/38 most anywhere in the world.
- It's more flexible. Now you can have the choice of printing on your system's printer or on a variety of IBM and non-IBM PC printers.
- It's more memorable. Now you can have concurrent access to your PC fixed disk while you're still in a system session.
- And it lets you do more, a lot more. Including electronic mail, document distribution, and other functions available with IBM's office applications.



Introducing IBM's smaller, smarter, faster 3278/79 emulation adapter.

The IBM Advanced 3278/79 Emulation Adapter lets you connect your IBM PC to a System/4300/3081/3083/3090. But that's only the start of it.

The Adapter card has been made smaller to fit a short slot, the price has been reduced to \$595*, the IBM PC memory requirement begins at under 21 Kb, and the Adapter's emulation software is now an expanded family of software with some remarkable new abilities.

- It's smarter. The emulation software can let your IBM PC act

*IBM single unit price.

as the mainframe gateway for an IBM PC Local Area Network.

- It's faster. Now you can transfer files up to 40% faster.
- It's more flexible. Now you can redefine the keyboard. Plus, you have the choice of printing on a 3270 Control Unit printer or on a variety of IBM and non-IBM PC printers. (You can even print out data from a host session on your PC printer while you're looking at data from a separate host session on your PC monitor.)
- It's expandable. When you're ready for more emulation functions, you simply move up within the family to a higher level of the emulation software.
- And it lets you do more, a lot more. Including electronic mail, document distribution, and other functions available with IBM's office applications.

For the rest of the story, contact your IBM marketing representative. Or see your local authorized IBM dealer.



Success in business

From page 66

your time working on the toughest problems facing the business. The most successful men and women develop the self-discipline it takes to do this and do it well.

Toughness or resilience is probably the most dominant characteristic I have observed in this group. These are people who have the ability to lock onto a problem and pursue it through many disappointments and failures to a successful solution.

On occasion, I have felt that maybe the dominant characteristic of these people was simply that they couldn't recognize when they had failed, refused to quit and went on to succeed. Again and again, you will find their brilliant business careers built squarely on the rubble of their early failures. They turned their early failures into learning experiences.

As a group, these people take a tremendous amount of pride in what they are doing.

Watching them in action is fascinating. They know more about their particular industry than anyone else. As you watch them make decisions in machine-gun fashion, you would first conclude that they are making intuitive decisions rather than carefully thought-out, logical ones.

In fact, these people are bringing the sum of their total prior experience to bear on a given problem. Their early successes, failures and disappointments are all focused on the problem at hand. The knowledge they have gained from their past experiences gives them the ability to decide quickly and accurately.

As a group, these people are extremely competitive. They love to finish first in whatever they are doing.

As much as I would like to, there is no point in trying to complete this speech without talking about success in terms of money.

The best way to make money is not to have making money as your primary goal. Again and again, I've seen great people come into the business world primarily motivated to make money. Almost without exception, they failed. They missed the real essence of learning to do something well, of building something better than anyone else, and were constantly reaching with only one objective in mind — to make money.

Fortunately, because you

live in this country, if you learn to do something better than anyone else, you will find that financial success comes as a by-product. This has certainly been true in my case to a unique degree. Making money has never been one of my goals.

I can clearly remember how shocked I was in 1968 when I suddenly realized that, because the entire team that built EDS had built it so well, we had created an organization that could generously reward the people who created it and who continued to build it. If we had set out to use EDS simply as a vehicle to make money, I don't believe we would have been successful at all. Instead, we set out to build a great company made up of great people. The financial rewards came as a by-product.

Don't expect the financial rewards to come quickly or easily. You would probably consider me to be quite successful at an early age. It took me 15 years to build up to an income that exceeded our family's monthly needs. Unrealistic expectations can

experiences and observations of others, I have concluded that if a couple has problems when their income is modest and later reach financial success, the success only compounds their problems instead of eliminating them. Success causes the marriage to break apart, because with success comes many complications, placing additional stress on an already faulty relationship.

If you question what I am saying, I can prove my point simply by suggesting that you walk through some very expensive resort, catering to people who are wealthy. Look at their faces. Watch them. How many of them are having as much fun as you and your family have? I'll never forget my first visit to such a place. I concluded from my observations that happiness and financial success are unrelated.

Learning to manage your own money is an important step to success. The people I have met who have been extremely successful made it a point to save money in their early years, when their incomes were small. They avoided the temptation, so prevalent with young people today, of engaging in deficit spending. They realized the need to be financially sound and resisted the temptation to spend everything they made or to spend more than they made.

Over a period of time, these people were in a financial position to make prudent investments and take advantage of opportunities that came their way. Contrast their position to the young couple who is deeply in debt and, in effect, running on a treadmill just to make all the payments.

Granted, we live in an age of rising expectations, but, as I said earlier, the acquisition of tangible things does not bring happiness. Spending beyond your means can put you under severe and unnecessary stress. I strongly urge all of you to stay solvent, save your money, plan for the things you want, work for them, wait for them and, when you can really afford them, buy them. Of course, buying a home is an obvious exception, but again, don't make a down payment on a house you really can't afford. If you do, you won't enjoy living in it.

I talked earlier about self-discipline. As you become more and more successful in your career, you will need another type of self-discipline. Something in human

nature causes us to lose interest in the things we do best, at our moment of greatest accomplishment.

Perhaps the easiest group to look at is the professional boxer. Starting out, the young fighter knows that he must undergo the drudgery of roadwork and training to keep his body in peak condition. Over a period of years,

your sense of balance, humility or the keen assessment of your strengths and weaknesses that you made years ago. Don't let yourself become a dilettante. Study the great corporations in this country. You will see that a common characteristic of these companies is that the people who created them had the self-discipline to

stay with them and to continue building them over a period of many, many years.

The old saying, "Cobbler, stick to your last," that is, keep to your own work, is very true in business. Learn something. Do it well. Stick with it. Avoid distractions. Never forget who you are, and most importantly, never lose sight of those things you can't do.

In closing, to build a successful career, expect to be involved. You are out on the field, not in the stands.

Theodore Roosevelt summed it all up beautifully:

"It is not the critic who counts, not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; who knows the great enthusiasm, the great devotions; who spends himself in a worthy cause; who, at the best, knows in the end the triumph of high achievement, and who, at the worst, if he fails, at least fails while daring greatly."

Copyright 1984 by EDS.

The best way to make money is not to have making money as your primary goal. I've seen great people come into the business world primarily motivated to make money. Almost without exception, they failed.

damage your effectiveness and potential.

In a group this size, there must be at least a few young people who have sizable personal or family problems, are unhappy for one reason or another and are saying to themselves, If I could just make a lot of money, I would eliminate all of these problems and be happy.

I wish there were some way that I could duplicate the experiences that I've had, so that each young person starting into business could share these same experiences, compressed into a much shorter period of time.

I can clearly remember August 1957, when my wife and I drove into Dallas with everything we owned in the trunk of our car. We have been very fortunate since that time. I can honestly report to you tonight, however, that we are not one bit happier as a result of financial success. The births of our five children brought us far more additional happiness than any of the unique experiences we have had as a result of business success.

In summary, based on my

he wins a series of fights and becomes champion of the world. His name, accomplishments and boxing skills are spread across the newspapers, radio and TV stations of the land. He is at the top of his profession.

Something in human nature causes him to start slacking off at this point. He begins to believe his press notices. He begins to believe he is invulnerable. He eases off on the training and roadwork, and the predictable happens: He loses his crown to some other fighter on the way up.

There is a plaque hanging in our offices that sums it up — "One is never more on trial than in a moment of excessive good fortune."

As you become successful, you will need a great deal of self-discipline to not lose

DEC
RENT • LEASE • BUY • SELL
SYSTEM SHOPPING SPECIALS

VAX® 11/785 VAXCLUSTER ADD-ON 8MB, FP785, C7850, VME, DESIRE, LIC \$137,900	VAX® 11/780 SYSTEM SPECIAL EMI, TURB, QM81, VME, LIC \$98,400	VAX® 11/790 VAXCLUSTER ADD-ON 4MB, FP790, C7750, VME, DESIRE, LIC \$56,100
---	---	--

SYSTEMS INCLUDE INSTALLATION, FREIGHT AND DEC LICENSES
IN STOCK SEPTEMBER SPECIALS

CI780-AA (Used) \$ 9,900	MS780-FD (Used) \$ 950
FP780-AA (Used) \$ 2,850	RA80-FA (New) \$15,950
H7112-A (Used) \$ 995	TA78-BF (Unused) \$42,850
MS780-CA (New) \$ 1,275	TU80-AA (Used) \$ 2,000

BROOKVALE ASSOCIATES... Our 12th Year
CALL NOW FOR YOUR FREE CATALOG. DON'T DELAY. CALL BROOKVALE TODAY!

YOUR BEST SOURCE FOR VAX® & PDP-11® SYSTEMS

WEST COAST: 800-252-6200
In WA State 206-392-9878
1495 N.W. Gilman Blvd., Issaquah, WA 98027

EAST COAST: 800-645-1167
In NY State 516-273-7777
265 Old Ave., Hauppauge, NY 11788
TWX: 510-228-7319

DEC, VAX & PDP-11 are registered trademarks of Digital Equipment Corp.



Where do you find the richest selection of productivity tools?

Computer Corporation of America.

Most people in the business know Computer Corporation of America for our advanced DBMS that is designed for unique applications development. The Model 204. With more flexibility, capacity, and productivity than any other DBMS.

But today's CCA is more than a database management system vendor. Much more.

Because today's CCA offers software to help you handle data in every phase of your information system.

Like our new DB Designer, the industry's most sophisticated interactive support environment for specifying and experimenting with database structure and design.

And for information systems development, there's Workshop, our robust fourth generation application development system. Or CCA's new Accolade. The only COBOL program generator that allows an applications programmer to develop, generate, test, and run his applications on either the mainframe or his PC.

The information retrieval options at CCA are incredible. There's Imagine, the only on-line report generator that really lets the MIS Director manage his production resources under CICS. There's a text document retrieval system, a statistical analysis system, and now there's Picture 204, a system that lets you store and retrieve color pictures on your mainframe.

And finally, there is ProdNet. The most comprehensive networking software on the market. It uses the mainframe as the

hub of the system to connect and control departmental PC LANs, 3270 terminals, word processors, and all kinds of peripherals. You can send parcels of electronic mail to virtually any kind of workstation or terminal connected to the mainframe.

And that's just the start.

Today's CCA offers a rich selection of productivity tools to help you handle information through every stage of its life. Very productively.

To learn more, send us the coupon for complete information. Or, call John Donnelly at 1-800-258-4100, ext. 700.

Please send me the complete story on your productivity tools.
Mail to: Four Cambridge Center, Cambridge, MA 02142.

Name _____

Company _____

Title _____ Telephone _____

Address _____

City _____ State _____ Zip _____

Computer Corporation of America

CCP A CrownTek Company

CW

New Dimensions in Software Productivity.

MANAGEMENT

CALENDAR from page 67

1986 World Congress on the Human Aspects of Automation. Long Beach, Calif., Sept. 22-24 — Contact: Public Relations Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Lasers in Automotive Manufacturing. Detroit, Sept. 23-24 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Computer-Aided Publishing '86 Exposition and Conference. Washington, D.C., Sept. 23-25 — Contact: CAP Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

International Videotex Industry Exposition and Conference. New York, Sept. 23-25 — Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

The Fourth Annual NCR Users Eastern America Conference. Atlantic City, Sept. 25-26 — Contact: ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

The Association for Women in Computing's Fifth Annual Conference.

St. Louis, Sept. 26-28 — Contact: AWC Conference '86, 407 Hillmoor Drive, Silver Spring, Md. 20901.

SEPT. 28-OCT. 4

1986 Society for Information Management Annual Conference. Dallas, Sept. 28 to Oct. 2 — Contact: 1986 SIM Annual Conference, P.O. Box 7030, Chicago, Ill. 60680.

National Communications Forum. Chicago, Sept. 29 to Oct. 1 — Contact: NCF, 505 N. Lake Shore Drive, Chicago, Ill. 60611.

Performance/Capacity Management Tutorial Week. Monterey, Calif., Sept. 29 to Oct. 2 — Contact: The Institute for Information Management, Suite 230, 1901 S. Bascom Ave., Campbell, Calif. 95008.

Video Expo New York. New York, Sept. 29 to Oct. 4 — Contact: Knowledge Industry Publications, Inc., 701 Westchester Ave., White Plains, N.Y. 10604.

Products '86. Dallas, Sept. 30 to Oct. 1 — Contact: Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

First National Desktop Publishing Trade Show. Chicago, Oct. 2-3 — Contact: The Personal Publishing Show,

P.O. Box 390, Itasca, Ill. 60143.

OCTOBER 5-11

Information Management Exposition & Conference. New York, Oct. 6-9 — Contact: Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

Computer and Communications Security '86. New York, Oct. 7-9 — Contact: Show Manager, Cahners Exposition Group, Box 5060, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

PC Expo. Chicago, Oct. 7-9 — Contact: 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Dexp West 86 Show. San Francisco, Oct. 7-10 — Contact: Expocons International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Laseractive '86. Boston, Oct. 9-11 — Contact: P.O. Box 3415, Indialantic, Fla. 32903.

OCTOBER 12-18

National Office Automation Conference. Washington, D.C., Oct. 14-16 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

Optical Publishing 86.

New York, Oct. 15-17 — Contact: Learned Information, 143 Old Marlton Pike, Medford, N.J. 08055.

Scan-Tech '86. San Francisco, Oct. 15-17 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

IBM, AT&T and Alternative Suppliers: Telecommunications Strategies. Washington, D.C., Oct. 16-17 — Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

OCTOBER 19-25

Third Party and Self Maintenance Conference. New York, Oct. 20-21 — Contact: Frost & Sullivan, Inc., Department RE-828 E, 106 Fulton St., New York, N.Y. 10038.

Informatics '86. Toronto, Oct. 20-23 — Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

OCT. 26-NOV. 1

International Data Corp.'s MIS Executive Conference. Palm Springs, Calif., Oct. 26-29 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

The Annual Teleconferencing Users Conference. Anaheim, Calif., Oct. 27-29 — Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

Hammer Forum '86. Cambridge, Mass., Oct. 27-29 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

Distribution Computer Expo '86 East. Parsippany, N.J., Oct. 29-30 — Contact: C.S. Report, Inc., P.O. Box 453, Exton, Pa., 19341.

NOVEMBER 2-8

Fall Joint Computer Conference '86. Dallas, Nov. 2-6 — Contact: FJCC '86, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

The Automated Manufacturing Exhibition and Conference. Greenville, S.C., Nov. 3-6 — Contact: P.O. Box 5616, Greenville, S.C. 29606.

Electronic Imaging '86. Boston, Nov. 3-6 — Contact: MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

North American Telecommunications Association Convention & Exhibition Showcase. St. Louis, Nov. 5-7 — Contact: NATA, Suite 550, 2000 M St. N.W., Washington, D.C. 20036.

We Need Software!

Systems Environment
The Club has a commitment to Digital Equipment Corporation via the largest regional installation of VAX processors with VAX/VMS in a clustered environment.

In the event that acceptable software solutions are not forthcoming, the Club may consider attractive alternative business solutions.

The Royal Hong Kong Jockey Club is a non-profit organization with sole responsibility for the administration and operation of all racing, betting and lottery systems in Hong Kong. Surplus funds are donated to charities or gifted to organizations for the benefit of the Hong Kong public. The general dimensions of the organization are:

- Annual turnover (handle), US\$2.7 billion
- Staff: permanent 3,900, part time 9,000
- Total systems investment of US\$94 million
- Club Membership, 11,000
- Facilities: two racetracks with capacity for 70,000, six restaurants, a country club, two multi-storey clubhouses, stables for 950 horses, equine hospital, 128 Off Track Betting Centres, etc.

Objectives of Information Systems Project

- To extend our computing utility from the transaction processing betting systems into the corporate financial and administrative areas.
- To provide authorized users with an integrated corporate information system built to the highest standards of performance, reliability, security, audit and maintainability.
- To move our bureau serviced applications; Payroll, General Ledger, Fixed Assets, Membership Accounting, Accounts Payable; in house, within a 2-year timeframe.
- To stay within the established systems environment.
- To obtain a packaged solution from a vendor who is willing to take prime responsibility for the components.

- The following packages are required:
 - Fixed Assets, General Ledger
 - Accounts Payable/Receivable
 - Payroll, Purchasing
 - Inventory Management
 - Human Resources Management
 - Property Management
 - Hospitality/Membership Services
 - Data Dictionary
 - Data Security Management
 - Audit and Quality Assurance tools

Requirements Summary

- A proposed relational data base management system and an associated data dictionary.
- Packages proposed should interface to the RDBMS or use VAX/VMS, RMS file structures.
- A comprehensive customer education and support proposal which incorporates significant on site support.
- Packages must be integrated or capable of being integrated so that data flow between them is built into the system and operates automatically.
- A proposal on migration strategy from existing packages to new packages.

Logistics — Bidding Process

- Potential vendors must register interest via Facsimile or telex by 5 p.m., HK time, on the 30-OCT-86, as below:
 - Attn. : Computer Services Controller
 - Ref. : Information Systems Proposal
 - Telex : 65581 RHJKC HX
 - Fax : (852) 5-762378
- Registered vendors will be forwarded a detailed information package by 30-NOV-86.
- All enquiries must be submitted, in writing by fax, and responses which are generally applicable to all parties will be distributed accordingly.
- Following initial evaluation, a short list of potential vendors will be formed. The short list will be invited to give formal presentations which may be followed by demonstrations and reference customer visits.
- The successful vendor or vendors will be required to sign the Club's Standard Purchase Agreement, a draft of which will form part of the information package.



The Royal Hong Kong Jockey Club

NEW PRODUCTS

Talaris mixes text, graphics on terminal

A terminal that combines alphanumerics, graphics and bit map capabilities has been introduced by Talaris Systems, Inc. of San Diego.

The terminal, called Talaris 7800, is available now at a price of \$2,890, according to a company spokesman.

The Talaris 7800 reportedly features Tektronix, Inc. 4014 emulation for graphics; Digital Equipment Corp. VT220 keyboard and VT220 emulation for alphanumeric text input; and a bit-mapped display with a resolution of 1,024 by 780 pixels in a 14-in. monitor.

The terminal also has 30 proportionally



Talaris 7800 terminal

spaced resident fonts and can be configured by the user to store up to 300K bytes of font bit maps that are downloaded from the host computer.

To accompany the terminal, Talaris has written a page previewing program, called Pretext, for users of the Tex computerized typesetting language. Pretext is priced at \$750.

According to a Talaris company official, the terminal combined with the software gives users the capability to integrate text and graphics on the screen and to view proportionally spaced text with the same typefaces they will see when they print the final page.

Pretext is said to include all the computer modern fonts that match those in Talaris's Texsupport software for its laser printers. The Talaris 7800 not only allows page previewing from typesetting software but also serves a variety of graphics applications, the vendor stated.

The Tektronix emulations provide graphics software compatibility with a range of graphics software. Vector graphics from other software programs that support the Tektronix 4014 can be scaled and merged into text. For previewing the page on the terminal, the user processes the device-independent file using Pretext. For printing on a Talaris printer, the user processes the device-independent file using Qdrive, Talaris's text and graphics integration package.

The 7800's Tektronix emulation supports point plot, incremental plot, patterned lines and four character sizes in hardware. Other graphics features include true pan and zoom, up- and downloading of raster graphics including fonts, a cross-hair cursor and automatic coordinate scaling.

Engineers serving real-time systems get PC workbench

Index Technology Corp. of Cambridge, Mass., has released Excelerator/RTS, a personal computer-based design workbench for engineers developing real-time systems. It reportedly provides integrated graphics, analysis, reporting, documentation and screen and report design facilities for the design of systems with time and control processing requirements.

Excelerator/RTS offers data processing analysis and design diagrams, such as data flow diagrams, structure charts and diagrams, entity relationship models and presentation graphs, that are used in the base Excalibrator product, a company spokesman said.

In addition, Excalibrator/RTS is said to support the following four graph types developed especially for real-time systems design: transformation graphs, also known as context diagrams, which show the flow of data and control within a system; state transition diagrams, which show the conditions and actions causing a change of state in a control process; matrix diagrams, which present conditional logic for decision tables or other diagrams; and block diagrams, which show signal flow between system hardware and software.

Excalibrator/RTS, available now, is priced at \$8,400 for single copies, with volume discounts available. It runs on the IBM Personal Computer XT and AT, the AT&T Personal Computer 6300, Compaq Computer Corp. Portable 286 and compatibles with 640K bytes of memory, a high-resolution graphics board and a mouse.

Excalibrator/RTS offers the capabilities needed to design and document almost any complex or embedded system, including those used in aerospace companies, process control, communications and system software, a company official stated.

Key components of the product include a graphics facility; the XLDictionary, in which the graph relationships are stored, modified, tracked and analyzed; a screen and report painting facility to design a user interface and to test it through data entry and reporting; and the XLD interface, which allows data to be shared among design team members, projects and host-based dictionaries.

Index Technology also developed Excalibrator for designing conventional data processing systems and XL/Design Integrator, a related product available on Digital Equipment Corp. VAX computers.

NEC tool builds board fluency

NEC America, Inc. of Melville, N.Y., has released Version 1.1 software for the company's SAR-10 Voice-Plus, a voice-recognition and audio-response board.

The SAR-10 Voice-Plus is said to be a fully integrated plug-in board for the IBM Personal Computer and compatible computers. Through a menu, users can reportedly create a vocabulary that defines spoken inputs, keyboard characters for spoken as well as special functions and word group assignments.

Voice-Plus is capable of recognizing 250 phrases and provides an additional 250 audio output messages, according to a NEC America spokesman.

The system plugs into any system stan-

dard bus slot and provides transparent utility programs during application software execution, according to the NEC America spokesman.

Version 1.1 software reportedly provides a number of features including improved audio output sampling frequency for additional messaging capability, autoexecutive voice-loader routing, vocabulary file name defaults, enhanced recognition and response functions and additional status displays. There is also a basic program for diagnostics and testing, according to the vendor.

Voice-Plus comes complete with board, Version 1.1 software and documentation. The package costs \$599.

On-line bulletin board debuts for Ramis II

Runs via Compuserve on IBM mainframe

Martin Marietta Data Systems of Princeton, N.J., has initiated an on-line bulletin board for its Ramis II fourth-generation language and data base management system users. The bulletin board provides communication among users as well as between users and Martin Marietta, a spokesman said. The software runs on IBM mainframes.

The Ramis II bulletin board, said to have been developed in response to Ramis II users' requests, is offered through Compuserve, Inc., an on-line information services company based in Columbus, Ohio. The service, called Forum, is available

to all Ramis II users at a cost of \$2 per access hour, in addition to basic Compuserve charges.

In order for users of Ramis II to access the bulletin board, they must have an account with Compuserve and be registered with Martin Marietta Data Systems Customer Service. The account with Compuserve is available through the purchase of a Universal Sign-Up Subscription Kit from the company or from computer retail stores for \$39.95.

According to Compuserve, in addition to the Subscription Kit, users must pay the cost of connect times, which is based on a bit/sec. rate and the time of day when the service is used. A 300 bit/sec. rate costs \$12.50 per hour on weekdays. The cost is \$6 per hour during eve-

nings and all day on weekends and holidays.

The kinds of information available on the bulletin board are said to include general information on the purpose of Forum, product information, support information such as education and hot-line news and a directory of Martin Marietta Data Systems offices.

According to a Martin Marietta spokesman, other kinds of information available in the bulletin board are guidelines for "how-to" articles that can be submitted by either Martin Marietta or client personnel, messages from the company's engineering staff about special situations that may lead to incorrect or unintended results and maintenance releases from engineering that contain updates for Ramis II.

INSIDE

Software & Services/76

Microcomputers/77

Communications/81

Systems & Peripherals/87

Price Reductions/88



Where IBM's
DB2 Relational DBMS
Falls Short...

Cincom's SUPRATM Soars.





SUPRA from Cincom[®] is the all-new advanced relational data base management system that soars free from the weaknesses that continue to haunt DB2 from IBM.^{*}

Performance. Referential Integrity. Entity Integrity. Integrated 4GL Capabilities. Implementation Ease. Redundancy Management. Dictionary Facilities. The list of DB2 shortcomings overcome by SUPRA goes on and on.

In fact, SUPRA's innovative *three-schema architecture* allows it to fly high above and beyond any relational system now on the market.

So if you're considering a relational DBMS, you really have only two choices. DB2 or SUPRA. Compare them.

You'll soon see why we're so confident in saying, "What we used to call competition, we're now calling prey."

To arrange for a SUPRA[™] demonstration, the SUPRA PC-based Electronic Brochure, additional SUPRA literature, or the SUPRA seminar schedule, simply return this reply coupon. Or call us direct.

1-800-543-3010

In Ohio 513-661-6000. In Canada 1-416-279-4220.

Name _____

Title _____

Organization _____

Address _____

City _____ State _____

Zip _____ Phone _____

REQUESTING: Demonstration Electronic Brochure Literature Seminar Schedule

 **CINCOM**

World Headquarters

2300 Montana Avenue, Cincinnati, OH 45211

Attention: Marketing Services Dept.

NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE & SERVICES

Systems software

Software Techniques, Inc. has released Diskit/VMS Version 4.4 system software for Digital Equipment Corp. VAX computers.

Diskit/VMS Version 4.4 is said to offer VAX system managers a solution to disk fragmentation. The software includes a data service unit utility, which is said to improve the overall system by restructuring the files in place on the disk. Diskit/VMS improves disk access speed by optimizing file extent sizes, creating contiguous files and by positioning both directories and frequently used files for quick access.

Diskit/VMS also includes XDIR, a

directory tool that allows extended search capabilities and command file generation, and Process, which is a process monitor that allows display of information on files.

Diskit/VMS costs \$3,950 for a VAX and \$2,500 for a Microvax II.

Software Techniques, 6600 Katella Ave., Cypress, Calif. 90630.

Applications packages

Sungard Computer Services Co. has announced Fastform 4.0, the latest release of its direct data entry software system for the IBM VM/CMS environment.

Key features of Fastform 4.0 include native CMS and CMS-DOS compatibility, supporting both OS and DOS user exit programs; batch control, totaling and balancing; operator statistics; and the ability to present

Help screens at the data-field level.

Additionally, Fastform 4.0 supports REXX language exit programs and provides the ability to switch from one screen format to another dynamically or in a specific sequence. It also features data duplication within and between records.

Fastform 4.0 costs \$12,000.

Sungard Computer Services, 1285 Drummer Lane, Wayne, Pa. 19087.

contributions by employee bargaining group and/or cost center; complete on-line validation prior to payroll calculation; and reliable audit trails.

The Payroll system costs \$25,000.

New Generation Software, 3840 Rosin Court, Sacramento, Calif. 95834.

Bell & Howell unveiled its Power+ DOD Accounting Package and Power+ Cost Accounting System, said to enhance the IBM Communications-Oriented Production Information and Control System's Manufacturing Resource Planning II.

The Power+ DOD Accounting Package is said to let users collect, track and report product costs. The package provides preliminary budget reporting, job ledger data base operations and job ledger reporting capabilities. The Power+ DOD Accounting Package costs \$20,000.

Power+ Cost Accounting is said to include actual cost tracking and reporting capabilities. The Power+ Cost Accounting Package costs \$35,000.

Bell & Howell, 2231 W. Howard St., Evanston, Ill. 60202.

Highlight your DASD problems to gain better online performance!

DASDMON highlights critical DASD I/O contention problems easily and comprehensively at your MVS or MVS/XA installation. DASDMON identifies the problems and also offers solutions via online displays and reports. It provides all the relevant details of DASD performance from the system level to dataset and job levels. DASDMON makes it easy to improve DASD I/O response time and gain better online performance.

DASDMON features include:

- ISPF realtime displays automatically identify specific jobs and datasets that are causing poor I/O performance.
- Rules-based problem analysis locates the bottlenecks (path, volume, etc.) and recommends action for DASD tuning.
- A CACHE analysis component computes the "cache hit ratio" at the dataset level to optimize the use of expensive cache controllers.
- Control cards are automatically generated to efficiently reorganize volumes and Partitioned Datasets.

Call us today at (800) 323-2600 for your FREE 30-day trial.



**DUQUESNE
SYSTEMS**

Two Allegheny Center
Pittsburgh, PA 15212
(800) 323-2600
(412) 323-2600 Inside PA

Uccel Corp. has announced Release 2.8 of UCC-7 Automated Production Control System, which runs under both the MVS and MVS/XA operating systems.

Release 2.8 includes a revised data base format that reportedly cuts in half the amount of time required to access the UCC-7 data base, condition code-checking capabilities and automated recovery facilities that reduce the time required to recover from hardware failures.

Release 2.8 costs from \$39,000 to \$65,000, depending on options.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

P-Stat, Inc. has ported its P-Stat software package to AT&T's Unix PC Model 7300.

Said to be designed for managing and analyzing data, P-Stat combines data and file management, data display, statistical analysis, survey analysis and report writing capabilities. P-Stat reportedly features an online Help facility, an interactive editor, flexible data entry and validation, relational data base capabilities, macros and a range of statistical procedures.

P-Stat for Unix PC costs \$995.

P-Stat, P.O. Box AH, Princeton, N.J. 08542.

Excalibur Sources, Inc. has released a multiuser version of Exsell, the company's automated sales and telemarketing software.

The version is said to incorporate features designed to take advantage of the AT&T Unix and Microsoft Corp. Xenix operating systems, including a multilevel scripting system for telemarketers and advanced management reporting capabilities.

The multiuser version of Exsell costs \$1,000 and up, depending on configuration.

Excalibur Sources, P.O. Box 467220, Atlanta, Ga. 30346.

NEW PRODUCTS/SOFTWARE & SERVICES

Response, Inc. has introduced its **Response Retail Management System** for the computer retail industry.

The Response Retail Management System has operator support record-keeping functions, said to allow multiple-company tracking for hardware warranties and software support agreements.

The system also reportedly offers a comprehensive Financial and Distribution Management System for a computer retail store, inventory, including serial number tracking in multiple warehouses, sales analysis, billing, payroll, point of sale, mailing list and potential customer tracking and sales representative calls.

The system operates on the IBM System/36 family, including the System/36 Personal Computer.

The Response Retail Management System costs \$6,995.

Response, P.O. Box 66, 608 2nd St., Jackson, Minn. 56143.

Languages

Unipress Software, Inc. has introduced Unishell, a Bourne shell script compiler.

Unishell reportedly analyzes a shell script, translates it into the C language, compiles it and then produces executable programs.

Unishell is available for a wide range of computer systems, according to the vendor.

Unishell for a personal computer-style machine costs \$395; for workstations, \$695; for Digital Equipment Corp. VAX 750 and 780 machines, \$995; and for supermicrocomputers, \$2,500.

Source code is available for any size machine at a price of \$4,995.

Unipress Software, 2025 Lincoln Highway, Edison, N.J. 08817.

Utilities

VM Software, Inc. has announced VMoperator and VMbatch software for IBM's VM environment.

VMoperator is said to enhance the interface between VM and the data center operations staff. The full-screen product supports 3270 Personal Computer-class displays. Features include the highlighting of important messages and hard-copy capabilities.

VMbatch reportedly allows a VM user to engage his own machine in interactive work while performing unattended tasks on one or more batch worker virtual machines. Users can query, submit, cancel and monitor batch jobs in the VMbatch system.

VMoperator costs \$9,000, and VMbatch costs \$8,000.

VM Software, Suite 355, 2070 Chain Bridge Road, Vienna, Va. 22180.

Precision Visuals has announced its Enter/Act User Interface Management System (UIMS) for technical software developers.

Enter/Act UIMS reportedly handles all application aspects of the user/computer interface, including prompt/command interaction, data entry or action menus and both alphanumeric and graphics windows. It is said to allow application prototypes to be implemented in days rather than months.

Enter/Act, initially designed to run under Digital Equipment Corp.'s VMS, is now machine independent

and can run on any device with alphanumeric capabilities similar to those of DEC's VT100.

Enter/Act costs \$20,000 for the initial development license.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

Boston Systems Office, Inc. has released BSO/C compiler with debugging support for the Motorola, Inc. 68000, 68010 and 68020 family of microprocessors.

BSO/C compiler is said to include features such as sophisticated addressing modes, efficient register management and branch optimization. With the debugging support, C programs for the 68000 can be debugged right on the VAX. BSO/Debug is said to allow the user to trace and

execute C source lines and labels for more accurate software development.

BSO/C compiler for the Motorola 68000, 68010 and 68020 family is priced from \$5,060.

Boston Systems Office, 128 Technology Center, Waltham, Mass. 02254.

Data base management systems

Data Language Corp. has introduced **Progress Test Drive**, a demonstration package said to offer all the features and capabilities of the firm's Progress fourth-generation relational data base management system.

Progress Test Drive includes a complete order-entry application that quickly demonstrates Progress' performance for transaction process-

ing applications, according to the vendor. Other Progress features included in Test Drive are easy modification on a flexible relational data base, crash-proof recovery from hardware, software and environmental failures and variable-length fields and records reportedly resulting in faster sequential processing.

Progress Test Drive costs \$50. Data Language, 47 Manning Road, Billerica, Mass. 01821.

MICROCOMPUTERS**Software utilities**

Aspen Research, Inc. has announced **Enter/3270**, an IBM Personal Computer-based data entry subsystem said to bring local front-end

Continued on page 78

IMPORTANT ANNOUNCEMENT FOR ALL U.S. COMPUTER PRODUCTS MANUFACTURERS!**Japanese computer buyers are targeting U.S.-made products!**

Japan, the world's largest computer market outside of the U.S., is eliminating all import tariffs on computers, peripherals, and parts during 1986 in order to relieve Japan-U.S. trade pressure. In fact, the Japanese are aggressively buying U.S.-made products in response to Prime Minister Nakasone's directive to "buy American."

As a U.S. computer product manufacturer, you can reach this explosive market by advertising in *Computerworld Japan* — Japan's leading computer news publication. *Computerworld Japan*'s readers are MIS/DP directors and key technical staff at virtually all the major computer-using sites in Japan. In fact, *Computerworld Japan*'s readers account for 75%-85% of the total Japanese corporate buying power for computer systems.

Modeled after *Computerworld*, its sister publication in the U.S., *Computerworld Japan* covers the

latest developments in the Japanese computer industry. Each week over 35,000 subscribers turn to *Computerworld Japan* for information on new products and services, current applications, industry trends, and international events.

CW International Marketing Services can help you reach this expanding Japanese market. For a free copy of "The Computer Marketplace in Japan," as well as information on our wide range of services, including frequency discounts, translation services, and billing in U.S. currency, complete the coupon and mail today.

**Yes, I want to reach the expanding Japanese market!**

Please send me:

- Information on *Computerworld Japan*.
- A copy of "The Computer Marketplace in Japan".

Name _____
 Title _____
 Company _____
 Address _____
 City _____
 State _____ Zip _____
 Phone _____

CW International, Marketing Services, Japan Desk
 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.
 (617) 879-0700, (800) 343-6474



CW COMMUNICATIONS/INC.
 an International Data Group company

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 77
processing to existing mainframe applications.

With Enter/3270 users can add local format storage, on-line Help, local data capture, display screen customization, keying assistance and extensive data validation to unmodified IBM 3270-based mainframe applications.

Enter/3270 costs \$500 per workstation.

Aspen Research, 773 El Cerrito Ave., Hillsborough, Calif. 94010.

Goldata Computer Services, Inc. has announced the Help software package, designed to aid software developers using IBM Personal Computers and compatibles to build on-line Help.

Help features include user-defined window sizes, tiled window capability, multiple window border types and user-defined speed at which windows appear.

The software is parameter driven and memory resident and is compatible with most languages and software products, including C, Cobol, Ashton-Tate's Dbase and Lotus Development Corp.'s 1-2-3.

Help costs \$99.95 for a one-user runtime license.

Goldata Computer Services, 2 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

Software data base management systems

Business Tools, Inc. has enhanced its TAS-Plus programmable relational data base.

TAS-Plus allows users to create, add, change and delete data base records without writing a program. A browse utility allows users to display multiple records and manipulate data. TAS-Plus allows users to create data management applications by using the screen painter, the traditional text editor or through the use of TAS-Plus source code editor.

TAS-Plus requires an IBM Personal Computer, Personal Computer XT, AT or compatible running Microsoft Corp. MS-DOS 2.0 or higher.

TAS-Plus costs \$69.

Business Tools, Suite 266, 4038-B 128th Ave. S.E., Bellevue, Wash. 98006.

Software enhancements

Microsolutions, Inc. has released Uniform-PC Version 2, said to permit use of more than 110 non-IBM Personal Computer disk formats on a standard Personal Computer XT and more than 160 formats on a PC AT.

Version 2 gives users the ability to read, write and initialize disks from most of the Digital Research, Inc. CP/M and Microsoft Corp. MS-DOS computers. Features include the ability to set a default drive, support for Apple Computer, Inc.'s Softcard CP/M and North Star Corp.'s CP/M hard sector formats — when used in conjunction with the new Matchpoint-PC card — and support for MS-DOS formats from computers that do not use IBM standards.

Version 2 costs \$69.95.

Microsolutions, 125 S. Fourth St., DeKalb, Ill. 60115.

Inmagic, Inc. has announced Inmagic Version 7, a text-oriented data base management system.

Inmagic Version 7 offers full-screen editing, password protection for field- and function-level security and basic arithmetic functions, including counts and totals. Inmagic Version 7 accepts information in variable-length fields with no size limitation.

Inmagic Version 7 for the IBM Personal Computer XT, AT and compatibles costs \$975 in single-unit quantities.

Inmagic, 238 Broadway, Cambridge, Mass. 02139.

Access Data Systems, Inc. has enhanced its Auditor callback security system.

Auditor reportedly was designed to secure dial-in access at central data centers with multiple secure-access modes. Independent of modem types or system protocols, Auditor features increased audit-log reporting capability with 42 basic messages and internal storage of up to 6,000 records. It also has multiple identification, time and port restrictions and assignable security levels.

Auditor costs \$4,150.

Access Data Systems, 766 Big Tree Drive, Longwood, Fla. 32750.

LeBaugh Software Corp. has released Version 1.1B of its Leprint software for dot matrix or laser printers.

Version 1.1B supports 31 additional dot matrix printers and is said to work twice as fast on laser printers. Leprint software is said to bring near-letter-quality printing and type-set quality to dot matrix and laser printers. The software works on IBM Personal Computers and compatibles. Version 1.1B has a minimum recommended computer memory of 256K.

Leprint Version 1.1B is priced at \$149.

LeBaugh Software, 2720 Greene Ave., Omaha, Neb. 68147.

Meridian Technology, Inc. has released Carbon Copy Version 3.0, a remote-control communications software package for IBM Personal Computers, Personal Computer XTs, Personal Computer ATs and compatibles.

Carbon Copy reportedly links together two PCs over an asynchronous communications link so that the two act as one.

Version 3.0 of Carbon Copy includes features such as remote printer support with conversion utility, dial-back security, log file with complete audit trail, automatic log-in through the addition of passwords to the call table, a hot-key function providing access in and out of IBM PC-DOS without losing data link and modem and line status display.

Version 3.0 costs \$195.

Meridian Technology, Suite 120, 1101 Dove St., Newport Beach, Calif. 92660.

Communications

Hayes Microcomputer Products, Inc. has introduced Interbridge, a local and remote connection for expanding Apple Computer, Inc.'s Appletalk Personal Networks.

Interbridge was designed to connect several Appletalk Personal Networks to improve access from one network to another. Interbridge is equipped with two Appletalk DE-9S ports and two RS-232C ports, which may be activated simultaneously.

Interbridge costs \$799.

Hayes Microcomputer Products, 705 Westech Drive, Norcross, Ga. 30092.

Coefficient Systems Corp. has announced VTerm/220, a Digital Equipment Corp. terminal emulation software package.

VTerm/220 is said to allow communication between IBM Personal Computers and compatibles and DEC VAX, Microvax and PDP-11 computers. VTerm/220 features include automatic reformatting of host files for insertion into Lotus Development Corp. 1-2-3 and Ashton-Tate Dbase, customized keyboard mappings and multilingual character set capabilities.

VTerm/220 is priced at \$245.

Coefficient Systems, 611 Broadway, New York, N.Y. 10012.

Why does Pier 1 think the world of Zeke?



Pier 1 Imports has good reason to salute Zeke automated scheduling. "Zeke reduces restart errors by as much as 65%," says Production Manager Ginny Johnson. "It speeds operations. Keeps work flowing properly."

"I've worked with a lot of

other schedulers. And Zeke simply works better."

Faster throughput. Fewer reruns. Greater productivity. Zeke works for Pier 1.

Why not put Zeke to work for you?

ZEKE
The scheduler that works.

SOUTHWEST SOFTWARE

Software that works.
813 Great Southwest Parkway Arlington, Texas 76011-5428
(817) 640-8911 (answered 24 hours a day) 1-800-227-7774 (outside Texas)

ARE YOU TIRED OF THE FOURTH AND FIFTH GENERATION HULABALOO?

THEN CHECK OUT AN ENTIRELY NEW CONCEPT IN PRODUCTIVITY TOOLS FOR THE MVS/TSO ENVIRONMENT.

I S O * F O R M

No language. No programming. Connects to existing COBOL record layouts. Ingenious hook-up to multiple record type files and arbitrary sets of related files. Unlimited online browsing. Instant generation of non-trivial, production quality reports in a spectacular variety of formats. Elegant subfile extraction machinery for porting data to other software and hardware. Much, much more.

WE, TOO, ARE WRITING THE HISTORY OF SOFTWARE.

For a free 30-day trial call (312) 848-1140
(ISO*FORM can be installed in an hour and put to work immediately.)

Isomorphic Systems, Inc.
1103 Westgate, Suite 300
Oak Park, IL 60301

EXPECTATIONS

The new ADDS 2020 will raise your expectations about all display terminals. You've always expected readable data. Now you can have high resolution, larger characters, 80/132 columns, 14" green, amber or white display, line graphics for highlighting, and variable-speed smooth scroll. There is, however, one thing you should not expect from the 2020—screen flicker. A unique 70Hz refresh produces a flicker-free display that you can read all day.

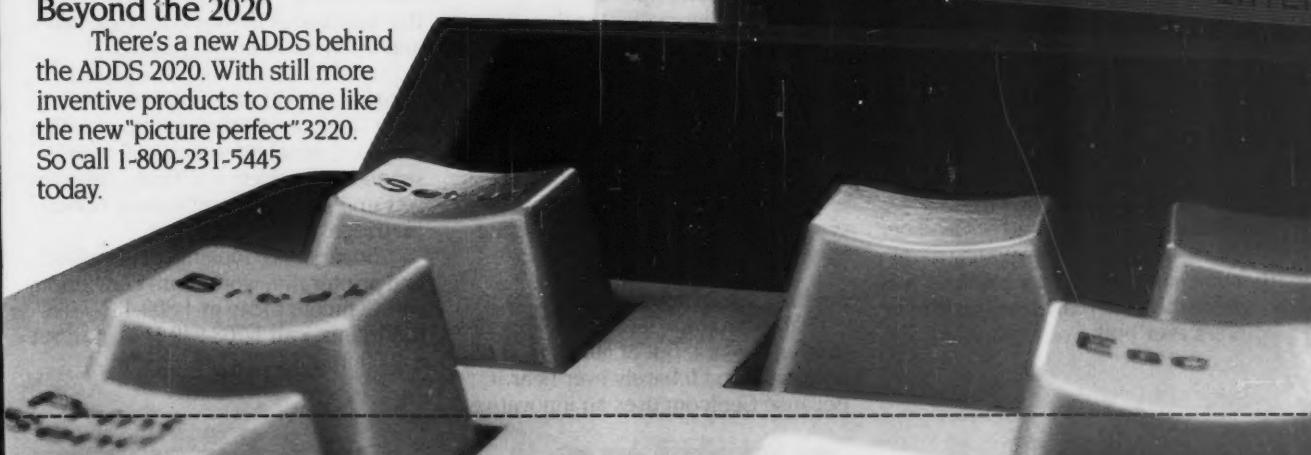
You've never expected 44 programmable keys with 88 modes and over 2500 characters of non-volatile memory to support them. Never expected it because the ADDS 2020 is the first terminal to give it to you.

The ADDS 2020 keyboard gives you a legend strip and the satisfying feel of solid quality. And if you like your PC keyboard, keep it. With the ADDS 2020 you can use IBM PC* compatible keyboards, even IBM's.

Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and telecommunications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

Beyond the 2020

There's a new ADDS behind the ADDS 2020. With still more inventive products to come like the new "picture perfect" 3220. So call 1-800-231-5445 today.



ADD S

Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation

100 Marcus Boulevard
Hauppauge, NY 11788 USA
Tel. 1-800-231-5445
In New York, (516) 231-5400

I'm surprised. I didn't expect so much from a terminal. I'd like to see more information on the ADDS 2020.

*IBM is a registered trademark of International Business Machines Corporation.

*Lotus is a registered trademark of Lotus Development Corporation.

Name _____ Title _____

Company _____

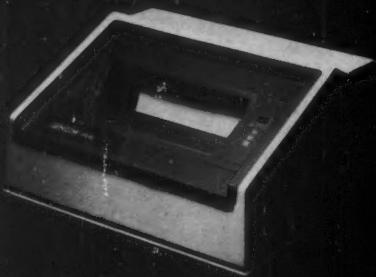
Street _____

City _____ State _____ Zip _____

Country _____

We've done 25 years of hard labor.

And it's still not the end of the line.



The Genicom 4000 line printer series has paid its dues. As a matter of fact, in a reliability test, its shuttle mechanism worked 24 hours a day, for over three years without failure. That's the equivalent of 25 years of normal use.

What's our secret? A totally new, patented resonance shuttle mechanism. It's perfectly balanced, so vibration is eliminated. And because the Genicom 4000s are free from those moving parts that normally fail in other printers, this could be the most reliable series of line printers ever built.

Printing At Line Speed.

The Genicom 4000 series was designed to tackle your most punishing printing applications in the blink of an eye.

Blaze through data processing at up to 800 lpm. Or shift into letter quality printing at 165 lpm. The Genicom 4000s even print difficult line and block graphics and bar codes at blistering speeds.

Solitary Confinement.

You can see a Genicom 4000 series printer at work. But at 60 dBA (55 dBA optional), you'll barely ever hear it. Because Genicom uses an innovative,

self-contained sound reduction system that eliminates the need for expensive and bulky external enclosures.

And to ensure that this printer remains a productive member of society, each Genicom 4000 is equipped with a standard serial interface, a 20 inch/second paper slew, multiple character sets and a long-life, self-inking ribbon cartridge.

So, if you're looking for a rugged line printer that works with conviction, call Genicom today at 1-800-437-7468. In Virginia, call 1-703-949-1170. And set a 4000 free.

GENICOM
The Printers That Mean Business.
One Genicom Drive, Waynesboro, VA 22980

NEW PRODUCTS/MICROCOMPUTERS

Data storage

Western Automation has announced the **Pro-Star** series of memory, storage and random-access memory (RAM) disk products for Texas Instruments, Inc.'s Business Pro computers.

RAM modules that attach to the motherboard of the Business Pro are available in 128K-byte increments.

There is a Pro-Star RAM drawer that occupies the memory shelf of the computer and houses up to 3M bytes of expansion modules sold in 512K-byte increments.

128K-byte motherboard modules cost \$125. The RAM drawer with 512K bytes costs \$495, and 512K-byte upgrades cost \$325.

Western Automation, 1700 N. 55th St., Boulder, Colo. 80301.

panded memory. Memek does not require the user to set DIP switches or adjust board jumpers.

Memek with 256K bytes of memory costs \$645; Memek with 1M byte costs \$795; and Memek with 2M bytes costs \$1,140.

Boca Research, 6401 Congress Ave., Boca Raton, Fla. 33431.

Univation, Inc. has introduced its **Dream Board**, a three-in-one multi-function board for use with IBM Personal Computers and compatibles.

The Dream Board provides two I/O ports, a clock/calendar and system accelerator capabilities said to increase processing speed by two to four times.

The Dream Board costs \$795. Univation, 1231 California Circle,

Milpitas, Calif. 95035.

COMMUNICATIONS**Controllers**

Renex Corp. has released **TMS-one EP**, an enhanced version of its asynchronous communications controller.

TMS-one EP is said to support multiple hosts and permit direct connection of ASCII devices to the CPU. The controller's emulation of IBM's 3270, 3290 and 3767 allows users to communicate in Binary Synchronous Communications, Systems Network Architecture/Synchronous Data Link Control or Async concurrently. The user can choose a menu from more than 150 Async terminals.

The TMS-one EP costs \$500.

Renex, 1513 Davis Road, Woodbridge, Va. 22192.

Ideassociates, Inc. has introduced **Diskit 2 Plus**, a compact external Winchester drive for the IBM Personal Computer XT and AT.

Diskit 2 Plus has twin 10M-byte removable drives and offers three types of on-line backup including image backup of all data from one external cartridge to the other, image backup from an internal drive to an external Diskit 2 Plus cartridge and file-by-file backup.

Diskit 2 Plus is said to provide 11,000 power-on hours as well as encryption for data security.

Diskit 2 Plus is priced at \$3,595.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

**Printers/
Plotters/Peripherals**

Facit, Inc. has announced **D2000**, a letter-quality printer for IBM Personal Computers and compatibles.

The D2000 is said to employ a soft-parameter setup in which Yes and No keys found on the printer panel allow operators to change print parameters by responding to the printer's questions. Other features of the D2000 include a low noise level and automatic paper-feed capability.

The D2000 also produces print in either unidirectional or bidirectional mode, depending on setup or interface requirements.

The D2000 is priced at \$695.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

Hattori Seiko Computer Peripherals has introduced its **Selkoshia MP-1300AI** dot matrix printer.

The MP-1300AI is said to have a print speed of 300 char./sec. Some features of the MP-1300AI include automatic cut-sheet paper loading and rear and bottom feed of fanfold paper.

The MP-1300AI costs \$799; with a color option it costs \$954.

Hattori Seiko Computer Peripherals, 1111 MacArthur Blvd., Mahwah, N.J. 07430.

Board-level devices

Boca Research, Inc. has announced its **Memek** four-in-one board for IBM Personal Computers and compatibles.

Memek is an expanded memory specification product said to allow control over the allocation of memory between video, system and ex-

"Without a doubt, Computerworld is the trade publication for the computer market."

Dianne Kearns
Director of Marketing
Lawson Associates, Inc.
Minneapolis, MN



Lawson Associates, Inc. develops a full range of accounting, personnel and payroll software packages for mid-size companies with Burroughs and IBM mainframes as well as IBM System/38s. When Dianne Kearns, Director of Marketing, started an awareness campaign for Lawson, she chose Computerworld.

As Dianne puts it: "Computerworld is the trade publication for the market. If anything gets read, it's Computerworld. I knew we would reach the appropriate decision makers."

The results? "Computerworld significantly out-produced two other trade publications and even performed exceptionally well against our own direct mail campaign in both quality and quantity."

Computerworld. We cover the entire computer world. Every week. We deliver the news, the analysis, and the audience. Just ask Dianne.

Call your local Computerworld sales representative, or Ed Marecki, Vice President/Sales, at (617) 879-0700, for all the facts.

COMPUTERWORLD

Boston: (617) 879-0700 New York: (201) 967-1350 Atlanta: (404) 394-0758 Chicago: (312) 827-4433 Dallas: (214) 991-8366 San Francisco: (415) 421-7330 Los Angeles: (714) 261-1230

A PUBLICATION OF
CN COMMUNICATIONS

NEW PRODUCTS/COMMUNICATIONS

Protocol converters

Renex Corp. has introduced its Bi-path reverse protocol converter equipped with a soft switch.

Bipath reportedly allows the IBM 3270 family of display stations to emulate industry standard ASCII terminals as well as perform normal 3270 operations. Bipath supports full keyboard emulation, full-speed capability up to 19.2K bit/sec. and scrolling. The soft switch allows users to enter and leave sessions with outside ASCII sources without having to manually activate the switch.

The stand-alone model of Bipath costs \$695.

Renex, 1513 Davis Road, Woodbridge, Va. 22192.

Software

Telisis Systems Corp. has introduced a VAX Networking Interface for use with its EDA-700 design workstations and Digital Equipment Corp.'s VAX CPUs.

The VAX Networking Interface is said to permit direct file transfer between Telisis workstations and a VAX, allowing users to tap VAX-based resources for mass storage, master library archival and file management. Used to facilitate downstream test and manufacturing applications, the interface can also be used to link the VAX as a gateway, enabling other environments to use Telisis drawing data directly.

The VAX Networking Interface costs \$3,500.

Telisis Systems, Two Omni Way, Chelmsford, Mass. 01824.

Multiplexers/Modems

Fibronics International, Inc. has introduced its FM3299 eight-port coaxial multiplexer.

The FM3299 is said to allow up to eight remote peripherals to access IBM 3274 Category A and Memorex Corp. controllers over a single coaxial cable. The FM3299 attaches to the adapter of an IBM 3274 controller via a coaxial connector.

Data reportedly can be transmitted up to 10,000 feet between controllers and Type A terminals, printers or plug compatibles.

The FM3299 is priced at \$800.

Fibronics International, 325 Stevens St., Hyannis, Mass. 02601.

Canoga-Perkins has introduced the 3272, an 18- to 144-channel fiber-optic multiplexer.

The 3272 reportedly handles asynchronous and synchronous speeds up to 76.8K bit/sec. in certain configurations.

The 3272 features standard SMA connectors and diagnostic capabilities to determine synchronization and local and remote loopback functions. Offered as a stand-alone or rack-mounted device, the 3272 also features full-duplex operation.

The 3272 fiber-optic multiplexer is priced from \$2,350 to \$5,350.

Canoga-Perkins, 6635 Independence Ave., Canoga Park, Calif. 91303.

Honeywell, Inc. has introduced the HFM5300 fiber-optic modem, said to improve the data transmission integrity of the IBM 5251 and other compatible cluster-controller systems.

The modem reportedly provides data communications links across distances of 5,000 feet. The HFM5300 can be used in any of eight positions designed for the IBM 5251 protocol, according to the vendor. It consists of an 850-nanometer, high-reliability LED transmitter and a high-reliability detector module.

The HFM5300 is priced at \$1,010. Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Test equipment

Mod-Tap System has introduced the RS-232 11-Lead and RS-232 8-Lead testers.

The RS-232 11-Lead tester is used to monitor EIA RS-232 interface signals at a 25-pin connector. It allows the user to monitor pins 2, 3, 4, 5, 6, 8, 20, 22, 25 and any other three of the remaining 16 RS-232 connector pins. The tester provides indication for on, off or undefined state for the RS-232 pins and derives power from the channel under test.

The RS-232 8-Lead tester is used to monitor RS-232 interface signals and gain access to any conductor at a modular jack or plug. It derives its power from the channel under test.

The RS-232 11-Lead and the RS-232 8-Lead testers cost \$58 each.

Mod-Tap, P.O. Box 706, Ayer Road, Harvard, Mass. 01451.

REACH OVER 120,000 ITALIAN COMPUTER PROFESSIONALS.

SPECIAL SMAU DISTRIBUTION

Advertise in CW Communications' Italian publications and sell your products directly to the fourth largest computer market in Western Europe.

Every week, 41,000 MIS/DP executives read *Computerworld Italia*. Modeled after *Computerworld*, its sister publication in the United States, *Computerworld Italia* covers the latest developments in hardware, software, terminals and supply products.

Every month, 50,000 IBM PC users and potential buyers read *PC World Magazine*.

The editorial focuses on a wide range of topics including software, hardware, in-depth articles and programs.

And, for the Apple Computer end-user market, we publish *Super Apple* each month.

CW International Marketing Services makes advertising your products in Italy, and around the world, easy. We have over 55 publications in more than 25 countries. For more information call Frank Curitza, Managing Director, CW International Marketing Services, at (800) 343-6474. Or fill out the coupon below and mail today.



Please send me more information on:
 Computerworld Italia Super Apple
 PC World Magazine Your brochure "The Computer Marketplace in Italy"
 Your other foreign publications

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____

CW COMMUNICATIONS INC.
 Frank Curitza
 Managing Director
 International Marketing Services
 CW Communications Inc.
 375 Cochituate Road
 Framingham, MA 01701-9171

ONCE THERE WAS FILE TRANSFER.

NOW THERE'S NDM.

Network DataMover® (NDM) doesn't just move files. It's the most advanced data transfer management system available for the IBM SNA mainframe environment.

NDM makes yesterday's file transfer systems obsolete with powerful data handling capabilities. NDM maintains data security. Automates operations. And continuously monitors data transfer activity.

Once there was file transfer. Now there's a system-wide solution to managing data movement through your network. Now there's NDM.

SYSTEMS CENTER
 1320 Greenway Drive
 Suite 300
 Irving, TX 75038
 (800) 292-0104
 In Texas, (214) 550-0318

FREE 30 DAY TRIAL! MAKE THE MOVE TO NDM.
1-800-292-0104 (Ex. (214) 550-0318)
 COMPANY
 NAME _____
 ADDRESS _____
 CITY _____
 STATE _____
 ZIP _____
 NDM-PC
 NDM-VSE

HOWDY,

NEC INTRODUCES THE 8500 WITH BUILT-IN SOFTWARE TO GIVE VARs A SHOT AT THE BIG TIME.

NEC heard ya, Vartner!

You say you need an exclusive? NEC heard you. The new NEC PC-8500 is yours and yours alone!

You say you need a powerful personal portable just asking to be packed with added value?

NEC heard you, Vartner! You just described the 8500 right down to the ground!

You say you need software they're not selling at the dime store? When you see the new Expert Software Series we have for you exclusively, you'll know NEC's tuned in.

And you say you can use a little extra ammo in that jungle out there? Well, when we tell you

about the national ads, co-op allowances, rebates, discounts, referrals, and high margins we offer you and you alone, you'll know for sure...NEC heard you, Vartner!

Of course, you're going to hear from us. We'll walk you through the hardware, talk you through the software and woo you with all our marketing support goodies.

We'll show you software cartridges loaded with the most professional software out there.



C&C

Computers and Communications

VARTNER!

There are two programs for insurance, one for real estate; built-in programs for everybody's business, plus a package of special utilities. All were created by leaders in their industry for professionals in the field.



And out in the field, the concept is already getting rave reviews.

It's the kind of opportunity every VAR we ever talked to has been hollering for. So just fire off a phone call and say "Howdy, Vartner!"... 'cause we want to know you heard us.

For customer support call 1-800-NEC-SOFT. For additional information, call 1-800-447-4700.



NEC PC-8500. NOW VARs HAVE SOMETHING NEW AND EXCITING TO SHOW, TO SAY, TO SELL.

Or write to:

**NEC Home Electronics (U.S.A.) Inc.
Computer Products Division
1255 Michael Drive
Wood Dale, IL 60191-1094**

NEC

Shouldn't you be a Subscriber?

If you want the complete inside story on the information management revolution, there's only one publication you need:
COMPUTERWORLD.



COMPUTERWORLD makes you an insider!

COMPUTERWORLD is the newsweekly computer professionals read. It's also the weekly for people in all areas of management who need to know what's going on, who want to be plugged into the information-management revolution.

COMPUTERWORLD is the source! Hardware. Software. Systems. Updates. Revisions. Add-ons.

COMPUTERWORLD is comprehensive. It covers micros to mainframes. Manufacturers. Systems. Applications.

COMPUTERWORLD puts it in context. What's new. Who's it for? What's compatible?

COMPUTERWORLD helps you decide. Buy it now or later? What do you lose if you wait? Is there something better on the drawing boards?

Subscribe Today!

There's no time for mailing coupons. For fast start-up, phone the toll-free number below and start your own subscription today at the special professional rate. Just \$38.95 for 51 weekly issues of **COMPUTERWORLD** . . . plus, 10 in-depth, single-topic issues of **COMPUTERWORLD FOCUS** at no extra charge. A bonus. A bargain. Indispensable!

1-800-544-3712*

COMPUTERWORLD is for users!

Written from the user's point of view . . . yours. What's right for your needs? How can you be sure? What are others buying? Are they happy with what they have?

How can you get more and better service and support from suppliers? Should you buy or lease? What are the disadvantages of one product or system vs. another? What didn't the vendors tell you that you need to know? See **COMPUTERWORLD**!

We have the largest, most experienced editorial staff of any computer publication. Full-time bureaus in four U.S. regions, plus Paris and Tokyo. A worldwide editorial staff of over 400 editors and reporters. Information is our subject and no one is more adept at gathering it.

NEW PRODUCTS/COMMUNICATIONS

C&S Electronics has announced its **Model 120** portable bus and time-automated grid (TAG) cable tester for users of IBM and Sperry Corp. products.

The Model 120 bus and TAG cable tester for IBM-type cables is said to instantly identify cable faults without removing them from the floor. Conductor-to-conductor, shield-to-conductor shorts and open connections are displayed. According to the vendor, the tester's 26 highly visible LEDs give instant and continuous display of wire status.

The Model 120 cable tester is priced at \$325.

C&S Electronics, P.O. Box 2142, Norwalk, Conn. 06852.

Fotec, Inc. has introduced the **Model T310 dual-wavelength test kit**, said to be designed for installing and maintaining the IBM 3044 and 8219 fiber-optic systems.

Tests that can be performed using the Model T310 fiber-optic test kit include testing the attenuation of fiber-optic cables and connectors, system transmitter power coupled into the fiber and received power. The kit can also be used to troubleshoot the system, according to the vendor.

The T310 test kit costs from \$2,950, depending on the options.

Fotec, P.O. Box 246, The Schrafft Center, 529 Main St., Boston, Mass. 02129.

SYSTEMS & PERIPHERALS

Processors

Clearpoint, Inc. has introduced the **SNXRAM**, a 12M-byte Sun Microsystems, Inc. Sun 3-compatible memory card that delivers full 15M-byte address space using a single slot.

SNXRAM is said to replace up to three Sun memory cards, freeing two Motorola, Inc. VMEbus slots for expansion. According to the vendor, it comes configured with no DIP switches for correct starting address and memory sizing. It is available in 4M-, 8M- or 12M-byte capacities.

The SNXRAM costs \$7,360 for the 12M-byte version. The 8M-byte and 4M-byte memory cards cost \$5,565 and \$3,760, respectively.

Clearpoint, 99 South St., Hopkinton, Mass. 01748.

General Robotics Corp. has added **Python/JR** and the **Super Python** to its product line of supermicrocomputers.

Both Python/JR and Super Python are said to be high-performance, multi-user AT&T Unix engines for Digital Equipment Corp. Q-bus. The Python/JR 32-bit single-board supermicro, said to be for one to eight users, features 2M- to 4M-byte parity random-access memory (RAM) and three asynchronous serial I/O ports. A 2M-byte system costs \$2,995; a 4M-byte system costs \$3,495.

The Super Python is said to support more than 100 users and features more than 2G-byte virtual addressing and 16M to 128M bytes of RAM. The Super Python is priced from \$19,950 for a 16M-byte system to \$89,950 for a 128M-byte system.

General Robotics, 23 S. Main St., Hartford, Wis. 53027.

Graphics systems

ISG Technologies, Inc. has announced the **3DFX** family of interactive computer graphics systems for real-time display of three-dimensional imagery.

The 3DFX uses a proprietary multiple digital processor design and is suited to real-time engineering applications requiring interactive solid modeling with shading and hidden-line removal. The 3DFX reportedly provides up to 80 million instructions per second of graphics processing power.

3DFX operates under AT&T Bell Laboratories Unix systems.

The 3DFX system costs from \$40,000 to \$50,000.

ISG Technologies, 145 Cityview Drive, Toronto, Ont., Canada M9W 5A5.

Datycop Corp. has introduced its intelligent imaging subsystem, the **General Purpose Imaging Interface** (GPII).

The subsystem is said to be designed to process large image files in real time. It includes an image processor that supports user-programmable algorithms for area compensation, contrast corrections, halftone control and image scaling. The GPII subsystem can interface the Datycop Series 600 electronic digitizing cameras to most computer systems.

The stand-alone GPII costs \$3,995.

Datycop, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

Data Storage

Applied Data Communications, Inc. has introduced its **CD-2500** duplicator for 1/4-in. streaming tape car-

tridges.

The CD-2500 is said to be capable of producing four, eight, 12 or 16 copies simultaneously in QIC-24 or QIC-11 format. The CD-2500 writes and verifies data from a Winchester disk-based micro to blank cartridges using a bit-map verification.

The CD-2500 costs \$39,995, including an IBM Personal Computer XT-type micro and four drives.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680.

Digital Equipment Corp. has introduced an **8M-byte memory board**.

The 8M-byte memory board is said to enable users to expand the Microvax II computer systems and the

Continued on page 88

Mark Your FREE Calendar For COMMUNICATION NETWORKS '87

February 9-12, 1987
Washington Convention Center, Washington, D.C.

Fill out and return the coupon below to get your FREE CN '87 pocket calendar* so you won't miss the 9th Annual Communication Networks.

CN '87 promises to be the largest conference and exposition ever, offering a telecommunications forum where the most vital issues are discussed by users, carriers, vendors, and policymakers. Last year, CN '86 was a proven success with over 300 exhibiting companies and 15,000 attendees.

Each day offers you useful, practical information — effective ways to deal with the constant changes in voice and data communications you'll face in 1987.

Monday, February 9th
Offers a full day of introductory and advanced "in-depth" seminars that deal with the latest facts, concepts and changes in the telecommunications industry that will affect your job.

Tuesday, February 10th-Thursday, February 12th
You can choose from more than 75 conference sessions over three days all designed to give you a broad perspective on every aspect of modern telecommunications use, management and regulation.

The exhibits alone will be an education. On Tuesday through Thursday you can compare new products and services offered by some of the world's leading companies with over 1,000 booths displaying new applications and top service equipment.

Be prepared for the telecommunications industry's new applications, technologies, and market challenges in 1987 — attend CN '87.

For your FREE calendar, fill out the coupon below and return it to:
CN '87, Box 9171, Framingham, MA 01701-9171.

YES, send me my free 1987 pocket calendar and I want to learn more about the Communication Networks '87 Conference and Exposition.

Please send me information on: Exhibiting Attending

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____

CW1

Communication Networks is produced by CW/Conference Management Group a division of CW Communications Inc., publishers of Network World and Computerworld, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171.

* Limited supply available.



NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 87

Vaxstations built on the Microvax II to 16M bytes.

The 8M-byte board is said to maintain all the features of previous DEC memory boards, while achieving the double-density capacity through zig-zag in-line package random-access memory chips.

The 8M-byte memory board is priced at \$5,000.

DEC, 146 Main St., Maynard, Mass. 01754.

IBM has announced main memory enhancements to and two controllers for the System/88.

The main memory enhancements expand main memory up to four times for the System/88. Memory is available in 8M-byte increments for users of the System/88 4575 Model 20B processor and in 8M-byte and 16M-byte increments for the 4576 Models 040 and 060 processors.

The controllers allow the System/88 direct-access storage device (DASD) controller to exchange information with System/88 processors with main memory greater than 16M bytes. The System/88 1020 DASD controller is used with the IBM 4580 disk drive.

The 8M-byte and the 16M-byte System/88 memory features cost \$36,500 and \$68,500, respectively. The System/88 1020 and 1030 DASD controllers cost \$6,630 and \$9,180, respectively.

IBM, 1133 Westchester Ave., White Plains, N.Y. 10604.

Printers/Plotters

Kentek Information Systems, Inc. has introduced the K-2 printer.

The K-2 is said to employ LED array imaging with on-board intelligence. Its intelligence is based on an integrated Motorola, Inc. 68000 microprocessor supported by a built-in 5½-in. floppy disk.

Functions range from a selection of page sizes, print orientations and fonts to the generation of complex vector graphics, such as statistical symbols and scientific and technical diagrams. The K-2 has two paper cassettes for feeding bond and letterhead paper, transparencies and labels. The K-2 prints 8½- by 11-in. sheets at a rate of 12 page/min.

The K-2 costs \$7,995.

Kentek Information Systems, Inc., Pearl Court, Allendale, N.J. 07401.

Interface Systems, Inc. has enhanced its ISI 487 IBM 3270-compatible dot matrix printer.

New features include the printing of on-demand bar code output using Code 39. According to the vendor, printing speeds are 200 char./sec. in draft mode and 50 char./sec. for near-letter quality. Standard features of the ISI 487 are said to include automatic forms alignment and an extended print buffer for local copy support of the IBM 3278 display terminals Model 3 through 5.

The ISI 487 costs \$3,950.

Interface Systems, Inc., 5855 Interface Drive, Ann Arbor, Mich. 48103.

Power Supplies

Instrumentation and Control Systems, Inc. has introduced an uninterrupted power system called Lifeline II.

Said to be designed to provide battery backup for up to 25 minutes in the event of a utility failure, Lifeline II has a built-in power conditioner that delivers filtered, regulated AC sine-wave power at all times.

There is no transfer time and its capacity is 100W, enough to power up to four IBM Personal Computer XT's or a minicomputer. Lifeline II features battery charge status, output power status displays and alarms.

Lifeline II costs \$2,780.

Instrumentation and Control Systems, Inc., 520 Interstate Road, Addison, Ill. 60101.

PRICE REDUCTIONS

Artek Corp. has reduced the price on its enhanced Ada compiler Version 1.10 for IBM Personal Computers and compatibles.

Features include additional support for library subprograms and generics and for formatting numbers into character strings and redirected compiler output.

The Ada editor is said to now support multiple windows and multiple files being edited simultaneously with numerous Ada language-specific features.

Ada compiler Version 1.10 has been reduced to \$495 from \$895.

Artek, 100 Seaview Drive, Secaucus, N.J. 07094.

California Software Products, Inc. has reduced the price of its Baby/34.

Baby/34 is said to allow users to replicate a full minicomputer environment on an IBM Personal Computer, Personal Computer XT, AT or compatible.

According to the vendor, Baby/34 comes with an RPG II compiler, screen format generator, sort entry utility, workstation I/O and data exchange utility.

The Baby/34 is now priced at \$1,250.

The Baby/34 with the Data File Utility now costs \$1,500.

California Software Products, 525 N. Cabrillo Park Drive, Santa Ana, Calif. 92701.

SERIOUS COMPANY!

Britton Lee is proud to be known by the company it keeps, including a long roster of Fortune 500 companies. What binds Britton Lee to this "society?" Its high performance relational database management systems.

Big companies have big databases that keep getting bigger. Britton Lee's database systems help them manage their data efficiently and cost effectively. We don't mind name dropping, especially names like *Boeing, AT&T, RCA Corporation, GTE, Lockheed, Honeywell, Hughes, Ford, ITT, Sperry, McDonnell Douglas, 3M, Chase Manhattan*.

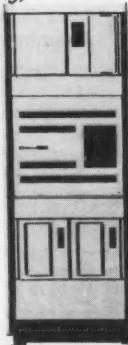
If you want more names, we have them. And they're not all Fortune 500 companies. Give us a toll-free call.

Britton Lee, Inc.

14600 Winchester Boulevard
Los Gatos, CA 95030

1-800-372-7111

1-800-624-6426 (Calif.)



High Performance
Relational Database Systems

"and we
meet at the
Invitational
Computer
Conferences
throughout
the world"

For 16 years, the "OEM Only" ICCs have brought OEM manufacturers to where the volume buyers live and work. And only the ICCs cover 17 major OEM territories throughout the U.S. and Europe - time and cost efficiently.

In one day, regional design engineers/system integrators can attend a full day of high-tech seminars and meet with major OEM suppliers of mini/micro computers, disk/tape drives, printers, terminals, controllers, etc. And the ICCs unique business hospitality format, unlike big national shows, make it easy for manufacturers to meet their invited guests one-on-one. So don't miss out! If you are a computer and peripheral OEM manufacturer, call us today to reserve space. If you are a volume buyer, call your local OEM supplier, or our offices, for an ICC invitation.

In the U.S., contact B.J. Johnson & Associates, Inc., 3151 Airway Avenue #C-2, Costa Mesa, CA 92626, Phone (714) 957-0171, Telex 5101002189 BJ JOHN.

In Europe, contact C.J. Nicholl & Associates, Ltd., 37 Brompton Road, London SW3 1DE, England, Phone 01-581 2326/9, Telex 888068 CJNAD G.



1986/87 U.S. SERIES:

Newton, MA—9/4/86
Dallas, TX—9/16/86
Minneapolis, MN—9/30/86
Gaithersburg, MD—10/16/86
Westlake Village, CA—10/28/86

Irvine, CA—1/8/87
 Ft. Lauderdale, FL—1/29/87
 Raleigh, NC—3/19/87
 Austin, TX—3/3/87
 San Jose, CA—3/17/87
 Nashua, NH—4/2/87

Munich, W. Germany—9/10/86
Stockholm, Sweden—9/16/86
London, England—9/22/86
Frankfurt, W. Germany—1/22/87
Paris, France—1/27/87
Milano, Italy—2/3/87

COMPUTER INDUSTRY

Section begins on page 114

Texet finds publishing sales pitch must focus on bottom line

CEO aims marketing at decision makers

By Eddy Goldberg

ARLINGTON, Mass. — Survivors in the high-end electronic publishing system market have learned a hard though simple lesson: Find corporate decision makers, sell them on the economic and time saving benefits of electronic publishing and explain the bells and whistles later.

One of the survivors is Texet Corp., a 6½-year-old start-up that reached \$12 million in revenue in fiscal 1985. The company has made a clear shift in its selling approach since the arrival of marketing-minded President and Chief Executive Officer Al R. Ireton late last year.

"The failure we've had is trying to sell electronic publishing systems to corporations as we did to commercial type shops," says Texet cofounder and Chairman Daniel Kennedy. "The reality is that we have to sell it as a solution to some kind of time problem and recognize that the need we're trying to solve is a business need."

Kennedy had previously cofounded Quadex Corp., a vendor of text processing systems that merged with Compugraphic Corp. in 1979. He co-founded Texet in April 1982, and the

firm began production deliveries of its electronic publishing systems in the third quarter of 1984.

But as recently as late 1985, industry observers were wondering whether the start-up would survive. Then Kennedy brought in Ireton, who had 25 years of experience in sales, marketing and general business. Ireton took charge of day-to-day management, leaving Kennedy free to focus on product development and strategic planning.

Texet's new approach appears to be succeeding. A fourth round of \$7.2 million in venture capital financing last April brought Texet's total capitalization to more than \$17 million. Kennedy and Ireton expect revenue to double to about \$24 million when fiscal 1986 ends next June.

For the technical document department manager, the benefits of electronic publishing are clear. However, the competitive importance of this capability may not be so apparent to decision makers. Texet now tailors its sales pitch to senior management on the capital expenditure committee, such as vice-presidents of marketing and sales.

"We need to find out the importance of documentation in the organization and who sponsors it," Ireton says. "We work to explain and define what computer-aided publishing is and how it's different from desktop publishing. It's a new industry and there is confusion."

Texet's product line, the Live Image Publishing System, is a high-end turnkey system designed for the corporate technical publishing market. The system includes semicustom, high-resolution workstations with proprietary software, graphic scanners, disk and tape storage devices, a laser printer, interfaces to phototypesetters and a local-area network.

Texet's primary target industries include computer hardware and software firms, electronics and manufacturing companies and aerospace firms, which publish government bid proposals that frequently need last-minute revisions.

Texet defines three market segments. The low-end and largest segment, which Texet estimates at about \$10 billion annually, includes word processing and desktop publishing done on personal computers, usually

for a maximum of \$10,000 per system. The mid-range segment, which Texet calls group publishing, includes systems that run from about \$10,000 to \$50,000 and is estimated to be a \$100 million annual market.

Texet places itself in the professional publishing market, where published documents have a direct impact on a company's bottom line. System costs run from about \$50,000 to \$1 million, and document sizes range from 50 to 1,000 pages. Other players in this estimated \$1.5 billion annual market include Xyvision, Inc. and Camax, Inc. Text and graphics are originated on other systems, such as word processors, micros and scanners, and then composed and paginated to produce a camera-ready document.

One way to convince decision makers in a time of capital spending cutbacks is through a leasing plan, in which the cost of the system is charged to operating expenses, thus moving it off the capital expenditure balance sheet, Ireton says. He says he thinks that a short-term, low-risk commitment with a relatively short payback period will move corporate decision makers off the fence.

"The problem is that potential customers aren't clear on the payback corporate electronic publishing offers them, so we provide the service," Ireton says.



Texet's Kennedy, standing, and Ireton

REACH OVER 40,000 AUSTRALIAN COMPUTER PROFESSIONALS.

CW Communications covers the Australian market with four publications.

Each week, 12,000 MIS/DP executives read *Computerworld Australia* for complete coverage of computer technology in medium-to-large organizations.

Australian PC World is Australia's only newspaper dedicated to IBM-standard personal computing. 12,000 IBM PC owners and potential buyers read *Australian PC World* each month.

Australian Macworld is Australia's magazine for the Macintosh user community. It is published bi-monthly and has a circulation of 12,000.

Communications World is CW's newest publication.

tion reaching the Australian market. This bi-monthly publication covers telecommunications, office communications and network management, and has a circulation of 10,000.

CW International Marketing Services makes advertising your products in Australia, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.

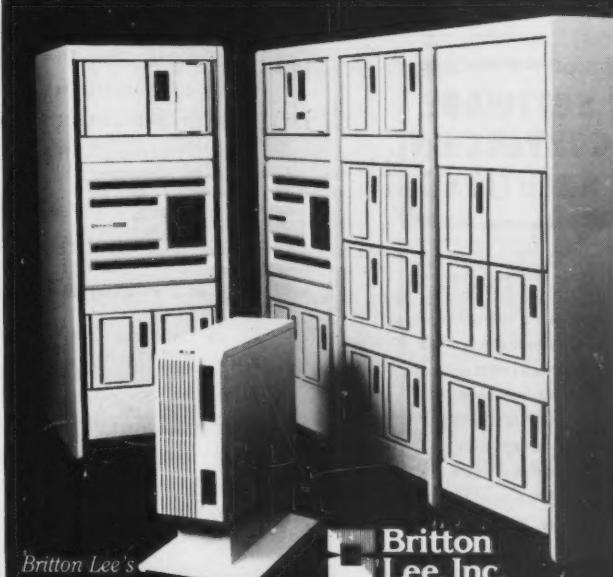


Please send me more information on:
 Computerworld Australia Australian PC World
 Australian Macworld Communications World
 Your other foreign publications
 Please send me a copy of your brochure entitled, "The Computer Marketplace in Australia".

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____

CW COMMUNICATIONS INC.
 Frank Curitica, Managing Director
 International Marketing Services
 CW Communications Inc.
 375 Cochituate Road, Box 9171
 Framingham, MA 01701-9171
 (617) 879-0700

SERIOUS RDBMS!



**Britton
Lee, Inc.**

1-800-372-7111 1-800-624-6426 (Calif.)

COMPUTER INDUSTRY

San Francisco firm teams up with Japanese for CIM projects

Consortium plans use of GM's MAP

By Takehisa Kondoh
CW Communications International
News Service

TOKYO — Bechtel Corp., a San Francisco-based engineering conglomerate, has formed a consortium with three Japanese firms to enter the burgeoning computer-integrated manufacturing (CIM) market.

The three Japanese firms slated to team up with Bechtel are Toyo Engineering Corp., Sumitomo Electric Industries Ltd. and Toyoda Machine Works Ltd. The four

as tools for computerized production.

It is thought that the upcoming joint venture involving the U.S. company will prove a stepping-stone to popularizing MAP throughout Japan. "Because of Bechtel's ties with IBM, many future customers of the consortium will turn to this protocol," a Toyoda Machine

official said.

Bechtel, one of the world's largest engineering firms, is said to be pursuing an aggressive diversification plan, moving into factory automation and microchips. Last fall, the company entered a partnership with IBM in CIM, and in July, it spun off a separate division for leading-edge technology businesses.

Sumitomo Electric and Toyoda Machine are two of Japan's foremost firms involved in computerized and networked manufacturing systems. Respectively, they lead the Japanese markets in optical fiber-based LAN systems and flexible manufacturing systems.

Toyoda Machine, a Toyota Motor Corp. affiliate, also is

one of six Japanese firms that have announced full support for MAP. Toyoda Machine recently began building a MAP-based system at its Tokyo factory.

While the consortium's primary target will be the U.S. and Japan, insiders speculate that its scope will broaden to include Southeast Asian and European firms.

IBM Software

DB2: The smart way to get your data...

'Because of Bechtel's ties with IBM, many future customers of the consortium will turn to this protocol.'

— Toyoda Machine Works Ltd. official

firms will coordinate efforts to win orders from U.S. and Japanese producers of autos, electronics, machinery and pharmaceutical products.

According to a Sumitomo Electric official, the deal will also stipulate that the partner firms exchange information on other leading industrial manufacturers with plans to use General Motors Corp.'s Manufacturing Automation Protocol (MAP) and local-area networks (LANs).

SOFTWARE CONVERSION SOLUTIONS

Datware provides the software translation system for your complex conversion problems. Over 18 years of conversion experience has resulted in thousands of satisfied customers, worldwide.

- COBOL to COBOL
- AUTOCODE/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- FORTRAN to FORTRAN
- PL/I to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/I
- DOS to MVS

Datware offers services & software to meet your needs. For more information, call or write today.

The Conversion Software People
Datware, Inc.
A Computer Task Group Company

3085 Union Road
Orchard Park, NY 14217-1214
Phone: (800) 367-2887
TELEX: 510-100-2155

IBM's Database 2 (DB2) is a database management system you can relate to. Fast enough to handle most production applications. Yet friendly enough to give users easy access to data.

In short, it's a smart way to manage business growth and change.

A Programmer's Delight

Because it's a relational system, DB2 is as simple to use as it is powerful.

Professional programmers can easily write production applications for DB2 environments.

With Structured Query Language (SQL)—a powerful and easy-to-use language—programmers can become

more productive because they can concentrate on what they want to process, rather than on how to get the data. For example, one line of SQL can do the work of many lines of COBOL.

And programmers can also be more efficient because of all the supporting software IBM has developed: high level programming languages, program generators and extensive programming tools and aids.

A User's Dream

What's more, SQL is based on English, which means that users can easily access information in DB2 files, either directly or by means of products like Query Management

COMPUTER INDUSTRY

Floating Point Systems reports \$2.9M third-quarter loss

Plans layoffs, hiring freeze

By Ninamary Buba Maginnis

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced a third-quarter loss of \$2.9 million, or 33 cents per share, as well as plans to cut 12% of its

work force, or about 200 employees.

Floating Point reported revenue of \$20.1 million for the third quarter ended July 31, a 38% drop from the same quarter last year. The supplier of array processors, mini-supercomputers and supercomputers reported in last year's third quarter a profit of \$3.6 million, or 43 cents

per share.

Besides the proposed layoffs, the firm plans a hiring freeze, a deferral of salary increases and general expense cuts in the company.

Lloyd D. Turner, Floating Point's president and chief executive officer, partially blamed the sharp revenue decline on intensified competition, especially in the minisuper-

percomputer market. Turner said funding delays on several large potential domestic orders and difficulty in closing some international contracts also injured third-quarter results.

"Because we underestimated the negative effects of a worsening capital spending environment and increased competition, our third-quar-

ter operating expenses were targeted for considerably greater revenue," he said.

Floating Point is not predicting an immediate recovery to previous revenue or net income levels, according to Turner. "Neither the economy nor the competitive environment are expected to improve measurably in the fourth quarter," he said.

Wang exec to be named Intecom CEO

By Stanley Gibson

ALLEN, Texas — Intecom, Inc., a maker of high-end private branch exchanges, confirmed last week that Wang Laboratories, Inc. Vice-President John Thibault will be named chief executive officer.

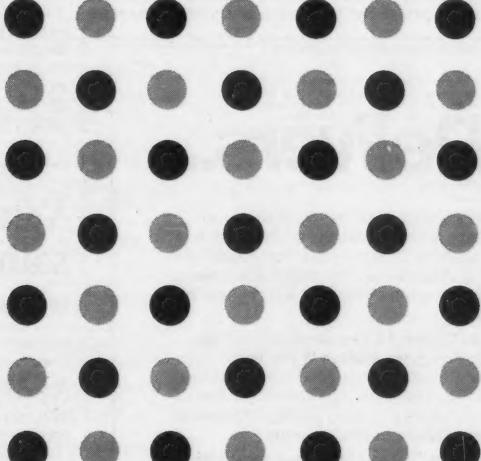
Thibault, Wang's vice-president of corporate quality, will assume his new duties at the completion of Intecom's acquisition by Wang, according to an Intecom representative. Stockholders will vote on the merger at a meeting Sept. 3.

Earlier, Intecom confirmed information from Wang sources [CW, June 9] that Thibault would be named to head the firm. A Wang representative, however, refused to confirm the appointment, saying only that Thibault would continue to be part of a team of senior-level Wang and Intecom managers in charge of the firm.

Thibault, 33, has been part of a transition team managing the acquisition of Intecom.

The Intecom representative said Erik Ringjob would remain in his position as president and chief operating officer, and Intecom founder and current Chairman C. Michael Bowen would become a consultant to Wang.

Separately, the representative said that Hal Denton, director of product management, is serving as acting vice-president of product marketing in place of Lee Thomas, who died recently.



...into shape.

Facility (QMF). So users can satisfy their own information needs without adding to the application development backlog. To assist users at every level, DB2 offers extensive online help screens.

Relational Relations

DB2 data is available to TSO, IMS and CICS users. DB2 was designed to take advantage of IBM's MVS and MVS/XA operating systems, and the multiprocessor architecture and large real storage on IBM systems.

This adds up to a lot of productivity for a lot of people.

Of course, DB2 comes with our excellent service, in-depth support and extensive educational offerings.

The next step is up to you. We can recommend any one of three smart ways to get more information on DB2. Contact your IBM marketing representative. Call 1 800 IBM-2468, Ext. CC/90, for literature. Or use the coupon below.



IBM
DRM, Dept. CC/90
101 Paragon Drive
Montvale, NJ 07645

9/1

Please send me information on IBM's DB2 software.
 Please have an IBM marketing representative call me.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

Series/1

- Custom Software & Systems
- RPS Specialists
- All types of communications
- Async • SNA • LU 6.2 • CM
- In-house Series/1 development laboratory

Applied Management, Inc.
1350 Piccard Drive, Suite 210
Rockville, Maryland 20850
301-670-4220

COMPUTER INDUSTRY



MERGERS AND ACQUISITIONS

Convergent Technologies, Inc. of San Jose, Calif., announced completion of its acquisition of the privately held **Display Data Corp.** of Hunt Valley, Md. Shareholders of Display Data now control 7.6 million shares of Convergent common stock and represent approximately 16.5% of the outstanding Convergent stock after the merger. Display Data, a leading vendor of computerized management systems, will become a key part of the Convergent Small Business Services subsidiary.

CMI Corp., formerly a wholly

owned subsidiary of **Torchmark Corp.**, announced the completion of an agreement to acquire 30% of the privately held firm from its parent company.

Forty percent of CMI has been retained by Torchmark, and 30% has been acquired by **Stephens, Inc.**, an investment banking firm based in Little Rock, Ark. Under this agreement, CMI Corp. becomes CMI Holding Co., a new corporation consisting of the shares owned by CMI, Torchmark and Stephens.

The Flagship Group, Inc., a microcomputer software holding company, announced that it has acquired **MC Software, Inc.** of Davis, Calif., for an undisclosed sum of cash and stock.

The Flagship Group is assembling a team of software companies with industry-specific products and is pro-

viding those firms with the resources required to capture a larger share of their respective markets. MC Software is the first of 10 to 20 acquisitions The Flagship Group is expected to make over the next two years.

Modular Computer Systems, Inc. (Modcomp) has become a wholly owned subsidiary of **AEG Aktiengesellschaft**. Modcomp is now an AEG company. AEG is a large, broad-based West German electrical and electronics company. It is a member of the Daimler-Benz group, with annual sales of more than \$20 billion.

American Management Systems, Inc. (AMS) has acquired the **Bankserv** product line of **Anacomp, Inc.**, including license and service agreements with 122 financial institutions and ownership of six credit manage-

ment software products for banks. AMS will pay an undisclosed amount of cash and royalties on the products.

ICOT Corp. announced that it has signed a definitive agreement to acquire **Integrated Network Systems Inc.** (INS) of Mobile, Ala., for one million shares of ICOT common stock. INS manufactures data communications products that allow personal computers to communicate, access and transfer data through the IBM Systems Network Architecture and international CCITT X.25 networks.

Emerald Technology Group, Inc. of Bellevue, Wash., announced that it has merged with **Software Systems, Inc.** (SSI) of Jefferson City, Mo. No financial details of the merger were disclosed. Founded in 1984, Emerald Technology markets data communications products for the IBM System/34, 36 and 38 market. SSI was founded in 1980 by Joe Frank, an architect of IBM's System/34 SSP operating system. SSI is a vendor of System/34, 36 and 38 communications products.

Continued on page 94

FOR VAX USERS

Digital News Delivers...

If you're using a VAX computer system—or you're planning to—you need specialized information. Now. To help you respond to changing VAX market conditions, developing product trends and emerging technologies.

You need a timely VAX-oriented newspaper that delivers...

...Regular Columns To Keep You Up-To-Date On Every Aspect Of VAX-Based Distributed Processing. Every two weeks, you'll get new information on the key topics that ultimately affect your work and decision-making. Our newspaper's reporters investigate—go beyond the announcements and hoopla—to bring you straight facts and perspective on: performance, pricing, service and support...valuable tutorials, buying guides, opinion and a biweekly look "Inside DEC"...all in one, convenient, well-organized, easy-to-read package.

...Product Round-Ups, User Surveys And Hands-On Reviews. New-product press

releases? Forget it. We're as cynical as you are. We'll probe, question, search and study. Tell you what's available. Find out what "real people" like you think. And give you the results of our own in-depth, hands-on evaluations and comprehensive ratings.

...VAX-Oriented Case Studies You Can Benefit From, No Matter What Your Industry. Learn from the good (and bad) experiences of your peers. You'll go beyond the general company profiles and delve into the VAX-specific solutions to problems just like yours.

...Answers To Your Specific Questions. Our reporters, columnists and feature-writers have worked at DEC and DEC-related companies...or for DEC-related or general computer publications. We've been there. We'll ask—and answer—the tough questions.

Tell us what you want to know, and we'll dig deep to get you the facts you can rely on.

...nothing but the VAX.

Digital News delivers those facts. 24 times a year. No fluff. No bull. Just fast, accurate, comprehensive, VAX-related news that's relevant to your needs. Information that you can trust and put to use. Now.

For a free subscription, fill in and mail the application next to this ad.

Or call 617-729-0935,

or write to:

Digital News,
P.O. Box 3, Winchester,
MA 01890.

Get **Digital News**.

**The subscription
is free.
The information
is priceless.**

*DEC and VAX are federally registered trademarks of Digital Equipment Corporation.

The Newspaper for VAX Computing

Digital NEWS

INSIDE DEC
Lab Division
Shakeup
Hewlett CRT

LOS ANGELES
DEC, Emulex Set
Out of court agreement may

Who sets the standards?

From page 114

nowhere near what it would have been four years ago, before the standard was established," Compaq Chief Financial Officer John Gribi said recently. "The industry doesn't have to wait on IBM anymore."

So who sets the standard now? Compaq? Intel? Microsoft? Ashton-Tate and Lotus Development Corp., with industry-standard software applications?

The answer is none of them—and all of them. Whether they make chips, spreadsheets or CPUs, all vendors will follow the fastest path to profits. They will go where the market is, and the market wants machines that solve problems and talk to each other. IBM and all of the above vendors have had a hand in shaping the standard to which the users have given their stamp of approval.

But as Gribi points out, the market has evolved too far for any one vendor, including a \$50 billion behemoth, to completely dictate. Securities analysts and shareholders love to grill Compaq about the possibility of IBM slamming the door on open architecture, but the Houston-based microcomputer wunderkind says it isn't worried.

"They can put proprietary features in read-only memory," Gribi said, "but they have to be useful. Will a software company write only for IBM when there are so many other users? Can IBM force them to? The standards issue is more subtle than just what is proprietary."

No one should be naive enough to think that IBM, at some point, will not become the leading vendor of 80386-based machines. But in order to do that, it must follow the installed base of users and the software leaders. And in order to accomplish that, it must make sure that it follows the de facto industry standard for the 80386 market, a standard that no longer bears the name IBM.

THE NEWSPAPER FOR VAX COMPUTING

Digital NEWS

APPLICATION FOR FREE SUBSCRIPTION

Please answer ALL questions, sign and date the application. Incomplete forms cannot be processed or acknowledged. For those questions requesting quantities, please respond with SPECIFIC numbers. The Publisher reserves the right to limit the number of FREE subscriptions accepted in any business category.

Your name, title, company name and company address must appear in the space provided in order for your application to be processed, or you may affix your business card. Subscriptions cannot be mailed to a home address.

1. What is the primary business activity of your firm at this location? (PLEASE CIRCLE ONE CODE ONLY)

- A. Manufacture of Computer Equipment (Data Processing Hardware, Software and/or Peripherals)
- B. Systems House, VAR, VAD, OEM
- C. Manufacturer of Non-Computer Products, Goods
- D. Agriculture, Mining, Oil, Natural Resources
- E. Transportation Utilities, Services
- F. Communications Utilities, Services
- G. Public Utilities (Electric, Gas, Sanitation)
- H. Non-Computer Retailing/Wholesaling/Distribution
- I. Financial Banking, Insurance, Real Estate Services
- J. Legal Services
- L. Education (Elementary, Secondary, College, University)
- M. Government (Local, State, Federal, Military)
- N. Computer Consulting, Training
- O. Other Business Consulting
- P. Engineering, Architecture, Construction
- Q. Research and Applied Research & Development
- R. Other Business Services
- Z. Other (please specify)

2. What is your primary job function? (PLEASE CIRCLE ONE CODE ONLY)

- A. COMPANY MANAGEMENT (TITLES INCLUDE: President, VP, Treasurer/Controller, Owner, General Manager, Business Manager, DEPARTMENTS INCLUDE: Accounting, Finance, Personnel, General Administration and Management)
- B. COMPUTER SYSTEMS MANAGEMENT (TITLES INCLUDE: VP EDP, MIS Director, Data Processing Manager, Data Communications Manager, Network Planner, Project Manager, DEPARTMENTS INCLUDE: EDP/MIS, Data Communications)

- C. ENGINEERING/R&D/SCIENCE MANAGEMENT (TITLES INCLUDE: VP Engineering, VP R&D, Chief Engineer, Technical Director, Director R&D, Project Manager, DEPARTMENTS INCLUDE: Engineering, R&D)

- D. DIVISION/OPERATIONS/MANUFACTURING/PRODUCTION (TITLES INCLUDE: VP Operations/Manufacturing/Production, Division VP, Plant Manager, Purchasing Director, Production Manager, Operations Manager, Quality Control Manager, DEPARTMENTS INCLUDE: Manufacturing, Operations, Quality Control, Quality Control)

- E. MARKETING MANAGEMENT (TITLES INCLUDE: VP Marketing, VP Sales, Marketing Director, Marketing Manager, Merchandise Manager, Product Manager, Sales Director, Sales Manager, DEPARTMENTS INCLUDE: Marketing, Marketing Research, Sales)

- F. ADMINISTRATIVE STAFF (TITLES INCLUDE: Adminstrator, Accountant, Bookkeeper, Controller, DEPARTMENTS INCLUDE: Accounting, Finance, Personnel, General Administration and Management)

- G. COMPUTER SYSTEMS STAFF (TITLES INCLUDE: Programmer, Systems Analyst, Systems Specialist, Systems Technician, Data Communications Specialist, DEPARTMENTS INCLUDE: EDP/MIS, Data Communications)

- H. ENGINEERING/R&D/SCIENCE STAFF (TITLES INCLUDE: Scientist, Systems Designer, Project Engineer, Applications Engineer, Technical Staff Member, DEPARTMENTS INCLUDE: Engineering, R&D)

- I. MARKETING STAFF (TITLES INCLUDE: Marketing Analyst, Sales Analyst, Sales Representative, DEPARTMENTS INCLUDE: Marketing, Marketing Research, Sales)

- J. EDUCATION/TRAINING (TITLES INCLUDE: Educational Administrators, Faculty, Instructors)

- K. CONSULTING (TITLES INCLUDE: Consultant, Advisor, DEPARTMENTS INCLUDE: Consulting, EDP/MIS, Communications)

- Z. OTHER (please specify)

3a. Are any of your VAXes part of a VAXCLUSTER?

- Yes
- No

3b. Are any of your VAXes part of a DECnet network?

- Yes
- No

3c. If your VAX systems are active nodes on one or more networks, is the network: (CIRCLE ALL THAT APPLY)

- A. local
- B. company-wide
- C. national
- D. international
- Z. NONE OF THE ABOVE

3d. Do you timeshare any DEC computers located elsewhere?

- Yes
- No

4a. Do you have any VAX computers installed at your location?

- Yes
- No

P.O. Box 3
Winchester, MA 01890-9960

Name _____

Title _____

Company/Division _____

Street/P.O. Box _____

City/State/Zip _____

I WISH TO RECEIVE A FREE SUBSCRIPTION TO DIGITAL NEWS.

YES NO

Signature _____

Title _____ Date _____

Business telephone () _____

11. For what applications are the VAX systems at your location used? (PLEASE CIRCLE ALL THAT APPLY)

- A. Programming/Systems Development
- B. Database Management
- C. Word Processing
- D. Scientific and Engineering Applications
- E. Communications/Network Control
- F. Accounting
- G. Office Automation
- H. CAD/CAM Graphics
- I. Business Graphics
- J. CAD/CAM
- K. CIM
- L. Statistical Analysis
- M. Project Management
- N. Order Entry/Inventory Control
- O. Financial Planning
- P. Education
- Q. Data Input/Analysis
- R. Process Control
- S. Materials Resource Planning (MRP)
- T. Personal Time Management
- U. Tax Calculation
- V. Job Costing
- W. Laboratory Control
- X. Real Time Simulation
- Y. File Management
- 1. Voice I/O
- 2. Image Processing
- Z. NONE OF THE ABOVE

12. In your job, do you help to purchase, recommend, specify or approve any of the VAX-related hardware, software, peripherals, or services listed below?

Yes No

(IF YES, PLEASE CIRCLE ALL THOSE THAT APPLY)

HARDWARE:

- 01. Supercomputers
- 02. Mainframe Computers
- 03. Microcomputers
- 04. Microcomputers

PERIPHERAL EQUIPMENT:

- 06. Letter-Quality Printers
- 07. Laser/Non-Impact Printers
- 08. Matrix Printers
- 09. Line Printers
- 10. Dot Matrix
- 11. CD-ROM/Optical Disk Subsystems
- 12. Tape Drives/Subsystems
- 13. Memory Boards
- 14. Portable, Telemeter Terminals
- 15. Video Display Terminals
- 16. Graphics Terminals/Work Stations
- 17. Graphics Input Devices
- 18. Plotters
- 19. Disk Controllers
- 20. Tape Controllers
- 21. Communications Controllers
- 22. Multiplexors/Concentrators
- 23. Local Area Networks
- 24. Wide Area Networks
- 25. Modems
- 26. A/D, D/A, I/O Hardware
- 27. Array Processor
- 28. Digital Signal Processors
- 29. Security Hardware
- 30. Power Supplies/Conditioners
- 31. Chassis/Backplanes/Racks
- 32. Cables

SOFTWARE:

- 33. Communications
- 34. Accounting
- 35. Order Entry/Inventory
- 36. Payroll
- 37. Time Billing
- 38. Financial/General/Spreadsheets
- 39. Project Managers
- 40. Word Processors
- 41. Language Compilers and Interpreters
- 42. Database Managers
- 43. Graphics/Computer A.M
- 44. Engineering/Scientific
- 45. Utilities/Development Aids
- 46. Data Security
- 47. MRP Software
- 48. Business Graphics
- 49. Videos
- 50. AI/Expert Systems
- 51. Resource Accounting
- 52. 4GL/Natural Language

SERVICES:

- 53. Maintenance
- 54. Education/Training
- 55. Software/Systems Design Consulting
- 56. Timesharing/Remote Computing
- 57. On-Line Databases
- 99. NONE OF THE ABOVE

THANK YOU FOR YOUR TIME AND FOR SUBSCRIBING TO DIGITAL NEWS — THE NEWSPAPER FOR VAX COMPUTING.

Please fold, tape and mail. PLEASE DO NOT STAPLE.

UNITED STATES
IF MAILED
NECESSARY
NAME
NO POSTAGE
NECESSARY
IN THE



Wincchester, MA 01890-9960
P.O. Box 3

Digital
NEWS

POSTAGE WILL BE PAID BY ADDRESSEE
FIRST CLASS PERMIT NO. 967 FRAMINGHAM, MA 01701
BUSINESS REPLY MAIL

NAME: _____
NAME: _____

DIGITAL NEWS.
specify or approve of any of the products or services listed on this form? If so, please
provide their names and titles below so that they may receive their own copy of
any other individuals at your location who help to purchase, recommend,

NEWS
Digital

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

Hardware Roundup (Product Spotlight, October 6) Covers large and medium-scale computer systems. Specifically looks at the past year's product innovations, significant revisions and enhancements, and what major players in the mainframe and supermini categories have been doing. A sidebar looks at what's going on with the BUNCH companies. Closing date September 19.

Hardware Roundup (Product Spotlight, October 13) Takes an in-depth look at small-scale systems — supermicros and minicomputers. Examines market figures, product announcements and changes over the last year. A chart provides a look at about 50 small-scale systems. Closing date September 26.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	*1000th Issue/40th Anniversary of the Computer*	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	*Computerworld Focus on Microcomputing *	October 3
November 17	Systems Integrators (Executive Report)	October 31
November 24	Vertical Markets (Executive Report)	November 7

Why not take advantage of these special opportunities to reach your customers? Executive Reports and Product Spotlights focus readers' attention — and that strengthens the power of your ads. Call Ed Marecki, Computerworld's Vice President/Sales at (617) 879-0700 — or call your local Computerworld representative — to reserve space for your ad today.

COMPUTERWORLD

Boston: (617) 879-0700 New York: (201) 967-1350

Atlanta: (404) 394-0758 Chicago: (312) 827-4433 Dallas: (214) 991-8366

San Francisco: (415) 421-7330 Los Angeles: (714) 261-1230



PRODUCT SPOTLIGHTS

COMPUTER INDUSTRY

Bell Atlantic names software chief, raises acquisition issue

PHILADELPHIA — Bell Atlantic Corp. last week appointed Gerard J. Caccappolo to the newly created position of vice-president of software and systems development, raising the possibility that Bell Atlantic may be planning to acquire a software firm.

"He was active in shaping Bell Atlantic's early direc-

tion outside the phone business," a Bell Atlantic spokesman said.

"The creation of the enterprises organization and the acquisition of Sorbus, Inc. are good examples," he added.

Although the spokesman declined to elaborate on specific acquisition targets, he was unequivocal in stating

the holding company's overall strategy.

"We have identified some opportunities for possible transactions," he claimed. "Software is a high-growth area of the industry, and we have the skills and vision to pursue it. The first step is to concentrate on the software industry outside the phone business."

Other regional holding companies have acquired software firms, but Bell Atlantic has yet to do so.

Recent acquisitions

In November 1985, Ameritech acquired Applied Data Research, Inc., and during this summer, U.S. West acquired banking software firm Applied Communica-

tions, Inc.

Caccappolo, 44, will assume the new vice-president position Sept. 15.

He came to Bell Atlantic as executive director of planning and corporate development in 1983. Caccappolo later became vice-president of planning and corporate development.

— Stanley Gibson

Continued from page 92

Protocol Computers, Inc. has concluded its merger with a wholly owned subsidiary of **Telematics International, Inc.**

Under the terms of the merger, each share of Protocol common stock, other than shares (52.4%) held by Richard L. Swartz, Protocol's founder and majority shareholder, will be converted into the right to receive \$1.40 in cash.

Wang Laboratories, Inc. recently acquired a minority stake in **Custom Software Services, Inc. (CSS)**, a Bellevue, Wash., software company targeting primarily the legal industry.

The terms of the acquisition contract allow Wang to increase its share of the common stock to 21% of the outstanding shares by 1989. Privately held CSS will continue to operate as an independent entity.

Sungard Data Systems, Inc. and **HSH National Management, Inc.** have reached an agreement in principle for Sungard to acquire HSH. The planned transaction is scheduled to be completed by Oct. 1.

HSH is a consulting firm providing planning and educational services in the areas of computer center disaster recovery, security and emergency preparedness.

The privately owned company is based in Columbus, Ohio.

Computer Task Group, Inc. announced its first international acquisition, **Shubrooks International, Ltd.** Shubrooks is a software consultant firm with headquarters in Chertsey, England, and offices in Newbury and London, England, and Kansas City, Mo.

Cincinnati Milacron, Inc. announced the signing of a purchase agreement with **International Laser Machines Corp. (ILM)** of Indianapolis whereby ILM becomes a wholly owned subsidiary of Cincinnati Milacron. Terms of the purchase were not disclosed.

ILM is a U.S. manufacturer of advanced laser machines and systems for industrial applications.



Lefebvre signs on with expert systems developer Cognitive

Former Multimate exec relocates

NEW HAVEN, Conn. — Ever since playing a key role in the 1985 acquisition by Ashton-Tate of Multimate International Corp., former Multimate Chief Operating Officer Richard Lefebvre has

been contemplating his next move. Lefebvre recently made that move when he resigned from Ashton-Tate to become president and chief executive officer of Cognitive Systems, Inc., replacing David Fox, who will continue to serve as chairman of Cognitive's executive committee.

Based in New Haven, Cognitive develops natural lan-

guage-based expert systems for the financial industry. Last year, the company recorded revenue of approximately \$4 million. Cognitive, which went public in May, employs 45 people.

According to Lefebvre, Cognitive is using an inferential reasoning technique to develop generic expert system products for targeted in-

dustries. "We're putting our bets on a world that is natural-language-oriented and doing complete AI systems," Lefebvre said.

Lefebvre noted that a whopping 80% of the company's revenue is devoted to research and development and that the company expects to continue in a development mode for another one to two

years. "We're a development company, not yet a commercial company," he said.

For the second quarter ended May 31, Cognitive reported sales of \$585,000 and a net loss of 1 cent per share, compared with sales of \$226,000 and a loss of 16 cents per share a year earlier.

— Maura McEnaney

© 1986 AT&T

THE HARDEST PART OF STARTING YOUR PC NETWORK WITH AT&T'S STARLAN.



Opening the box is about as hard as it gets. After that, all you have to do is plug an AT&T STARLAN Network Access Unit card into an expansion slot in each of your PCs. Then connect the PCs using ordinary modular phone cord.

Next, install your AT&T Network Program, and just like that your independent-minded stand-alone becomes a team player ready to share information, software and high-priced peripherals.

As many as ten computers can be linked together this easily. And because there's no expensive central equipment to buy for this basic Daisy Chain configuration, your start-up costs are kept to a minimum.

Expanding your network is easy too. Thanks to STARLAN Network's modular design, you can do it with standard telephone wiring and a Network Extension Unit. So up to one hundred users spread across an entire department can work more productively together.

Your departmental STARLAN Networks can also be linked by connecting them to AT&T's powerful Information Systems Network. So virtually all the information processing equipment throughout your company, from PCs (using MS-DOS or UNIX operating systems) to mainframes, can be part of a fully integrated, cost-effective system.

STARLAN Network is backed by AT&T's century of networking experience. It's efficient, reliable, and available now. To find out how to take your first step towards a total networking solution, contact your AT&T Account Executive, your authorized AT&T supplier or call 1 800 247-1212.

*Trademark of Microsoft Corporation



The right choice.

Tandon splits into two units

From page 114

vertically integrating within the disk drive unit, they will be able to save money," he said.

Last week's reorganization also shifted control of day-to-day operations from founder Sirjang "Jugi" Tandon to former IBM executive and current Tandon President Dan Wilkie.

Under the reorganization plan, Wilkie will head up a new committee overseeing the two business units. He will also be in charge of the microcomputer business unit, with fellow IBM veteran H. L. "Sparky" Sparks in charge of sales and marketing for the unit. Sparks was responsible for Tandon's entry into the personal computer dealer channel in July.

Another former IBM employee, Joseph A. Sarubbi, will head the disk drive and subsystem unit, with Jeff Segers retaining his responsibility for sales and marketing of those products. Sarubbi, former technology and systems architecture director of IBM's Entry Systems Division, joined Tandon last February.

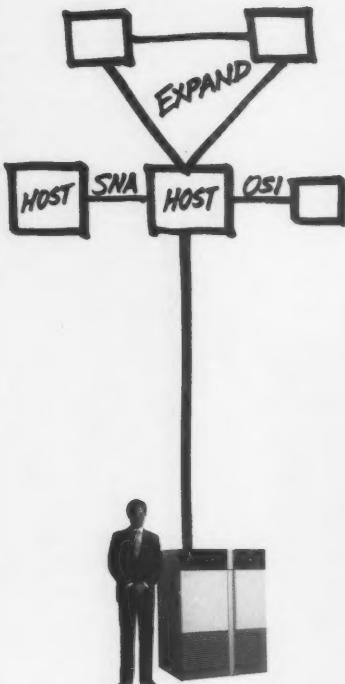
Shearson's Stone was not sure how Tandon's executive changes fit in with its recent personal computer strategy. "Jugi is a bit of a street fighter, and PC compatibles is not a polite market," Stone noted.

Analysts say Tandon also has other problems to contend with, particularly in production schedules. A Tandon version of the PC AT will not ship until after its Christmas 1986 target date, analysts say.

M ANAGEMENT	R EPORTING/RETRIEVAL
C APABILITY	
for THE IBM S/38	
For more information Contact Charles White at: michaels, ross & cole, ltd. 800 West Roosevelt Road Building E, Suite 304 Glen Ellyn, IL 60137 (312) 790-5040	

NonStop EXT.TM

Tandem technology extends transaction processing to a compact, low-cost system.



LOCAL AUTONOMY. CORPORATE UNITY.

The EXT is the low-cost system that lets you distribute your processing to the local level. More work gets done and you save communications costs. And because the EXT knows its way through all the major protocols (SNA, X.25 and O.S.I.) it can connect to and integrate with your network.

A COMPUTER ROOM ON WHEELS.

Everything is contained in one cabinet that needs no special air-conditioned environment. Just wheel it in and plug it in. Unpacking and set-up require only about an hour.

YOU GROW, EXT GROWS.

To add power, just add processors. You can grow from four to over 22 ET-1 transactions per second. You can upgrade memory from four to 64 megabytes. Grow at each location or grow to new locations, with software that's compatible throughout your Tandem network.

EVERYTHING'S EASIER.

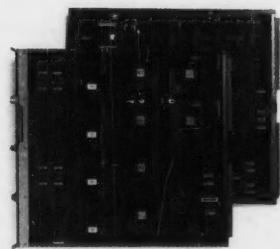
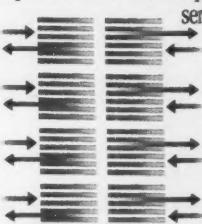
All major components are field-replaceable, so servicing them is fast and foolproof. Our high-performance, relational database simplifies use. And powerful programmer tools speed up application development.

NO MORE TAPE REELS.

A tape cartridge snaps in and out and stores 90 megabytes, replacing two full reels of tape. There's room to add another tape drive if you need it.

THE DATA EXPRESSWAY.

Multiple high-density disk drives allow parallel data access. This speeds up data flow and shortens response time. Each drive can be individually maintained and replaced without interrupting service.



COMPACT COMMUNICATION CONTROLLERS.

They're all on a single board. Advanced, high-density circuitry saves space and increases reliability. Communications lines can be configured individually and can function simultaneously.

NO-FAULT INSURANCE.

Tandem's unique, parallel architecture keeps you up and running without the waste of idle backup components. Instead, multiple components share the workload. If one fails, the others pick up the slack.



EXTEND US A CALL.

Tandem systems are already at work for Fortune 500 Companies in banking, telecommunications, manufacturing, retailing and energy, as well as several branches of the U.S. Govt.

To find out what we can do for you, call 800-482-6336 or write: Tandem Computers, Incorporated, 19191 Valco Parkway, Loc. 4-31, Cupertino, CA 95014.

 **TANDEM COMPUTERS**

COMPUTER INDUSTRY



Automatic Data Processing, Inc. reported revenue for the fourth quarter ended June 30 of \$318.6 million, compared with \$266.7 million in the like quarter last year. Profits were \$30.9 million, or 42 cents per share, compared with \$26 million, or 36 cents per share, a year ago.

For the year, revenue was \$1.2 billion, compared with \$1 billion in the previous year. Profits were \$106 million, or \$1.45 per share, compared with \$87.6 million, or \$1.22 per share, one year ago.

Computer Memories, Inc. reported revenue for the first quarter ended June 30 of \$4.2 million, compared with \$50.5 million last year. Profits were \$11,000, compared with \$4.8 million in the like period a year ago.

Ultimate Corp. announced revenue for the first quarter ended July 31 of \$36.7 million, a 39% increase from revenue of \$26.4 million for the same period a year earlier. Profits were \$2.3 million, or 25 cents per share, compared with \$2.5 million, or 30 cents per share, in the comparable period last year.

Bolt Beranek and Newman, Inc. reported net income for the fourth quarter ended June 30 of \$3.4 million, or 39 cents per share, compared with \$2.4 million, or 29 cents per share, in the like period a year ago. Revenue for the quarter was \$49.3 million, compared with \$41.6 million in the previous year.

Corvus Systems, Inc. announced revenue for the year ended May 31 of

Retailer breathes life into products

From page 114

machines as ready-to-run systems. Godfather's, whose major business is selling close-out equipment, plans to enter manufacturing with Columbia's PC AT-compatible, which was designed just before the company folded, Welsh reports.

Godfather's will use the acquired Columbia printed circuit boards for the computers and will farm out any future manufacturing, if required, according to a Godfather's manager.

Victim of poor management

Many industry observers say they feel that Columbia is a classic case of a well-regarded micro product that fell victim to poor management and the saturated IBM-compatible micro market.

Whether a small Florida retailer can revive that product line remains to be seen, but user confidence in Columbia's technology appears to be one point in Godfather's favor.

"In the military, there's a weapon called the .45 automatic," the U.S. Navy's New says. "It takes beatings, grindings, mud, slush, and it always works for us. This Columbia machine is like that for us. It's a very fine machine."

\$42.1 million, compared with \$53.3 million in the previous year. Net loss for the year was \$32.8 million, or \$1.17 per share, a 61% increase from a \$20.4 million, or 79 cents per share, loss in the previous year.

For the fourth quarter, revenue was \$11.4 million, compared with \$12 million in the like period last year. Net loss was \$3 million, or 11 cents per share, compared with a net loss of \$14.8 million, or 57 cents per share, for the comparable period last year.

Tandy Corp. reported revenue for the year ended June 30 of \$3 billion, compared with \$2.6 billion in the previous year. Profits were \$197.7 million, or \$2.22 per share, compared with \$189.1 million, or \$2.11 per share, a year ago.

For the fourth quarter, revenue

was \$690.8 million, compared with \$603.8 million in the same quarter last year. Profits were \$26.8 million, or 30 cents per share, compared with \$53.2 million, or 60 cents per share, in the like period a year ago.

Emulex Corp. announced revenue for the fourth quarter ended June 29 of \$27.9 million, compared with \$24.5 million in the like quarter last year. Profits were \$2.3 million, or 17 cents per share, up 112% from \$1.1 million, or 8 cents per share, reported in the same quarter a year earlier.

Massachusetts Computer Corp. reported revenue for the year ended June 30 of \$50.9 million, compared with \$45.2 million in the previous year. Net loss for the year was \$1.5 million, or 11 cents per share, compared with a net profit of \$980,000,

or 7 cents per share, last year.

For the fourth quarter, revenue was \$15.5 million, compared with \$11 million in the like quarter last year. Net profit was \$760,000, or 5 cents per share, compared with a net loss of \$1.2 million, or 8 cents per share, in the previous year.

Computer & Communications Technology Corp. announced a net loss of \$7.6 million, or 99 cents per share, on revenue of \$17.4 million for the second quarter ended June 28. This compares with a net income of \$177,000, or 2 cents per share, on revenue of \$25.4 million for the comparable period a year ago.

Silicon Graphics, Inc. reported revenue for the year ended June 30 of \$41.5 million, compared with \$21.5 million in the previous year.

The United Kingdom is one of the world's largest computer markets. And you can profit from it.

The United Kingdom is one of the largest and most developed markets in the world for technological products. Total MIS/DP expenditures in the United Kingdom are forecast to exceed \$28 billion by the end of 1989, according to International Data Corporation, the world's leading market analysis and consulting firm for the information processing industry.

You can capture a share of this prospering marketplace by advertising in any of CW Communications' publications focused on the ever-evolving U.K. computer market.

If you sell products to the MIS/DP market, you need to advertise in *Computer News*. Each week 100,000 MIS/DP professionals rely on *Computer News* for up-to-date analysis and information on all aspects of the industry.

If you market IBM PC or compatible products, you can target 33,000 business executives in the PC market with *PC Business World*. Each week *PC Business World* ex-

plores the best products and presents up-to-date information on the IBM personal computer market.

If you sell DEC or DEC-compatible equipment, you can reach 11,000 DEC users, dealers, and suppliers with *DEC Today* each month.

And, if you market ICL or compatible products, you need *ICL Today* — our newest publication in the United Kingdom. *ICL Today* is unique because its readers include not only a large base of ICL users, but also dealers, distributors, OEMs, and software and systems houses. *ICL Today* reaches 20,000 managers each month.

With more than 55 publications in over 25 countries, CW International Marketing Services makes it easy for you to advertise your products in the United Kingdom — and around the world. For more information on our wide range of services, complete the coupon and mail today.



CW International Marketing Services, U.K. Desk
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

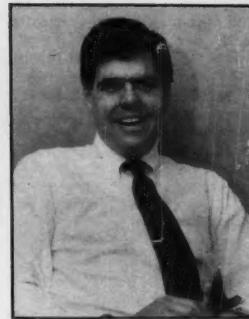
Please send me information on:

- Computer News*
- ICL Today*
- DEC Today*
- PC Business World*
- Your other foreign publications
- Please send me a copy of your brochure entitled, "The Computer Marketplace in the United Kingdom."

Name _____
Title _____
Company _____
Address _____
City _____ State _____
Zip _____ Phone _____

"When trying to reach VAX users, Computerworld gets results."

R. Stephen Lilly
Director of Marketing
Computer Information Systems
Braintree, MA



Steve Lilly, Director of Marketing for Computer Information Systems (CIS), had set a clear enough goal: he wanted to introduce CIS' system management software, Quantum RS, to the marketplace and explain how it is used for VAX resource tracking, capacity planning and resource/cost allocation. Steve delivered his message in Computerworld as well as in other trade publications. He quickly discovered that Computerworld does, indeed, get results. "Computerworld has helped CIS reach its target audience — the decision-making systems managers who are current and future users of VAX systems," he says. "Basically, Computerworld readers are serious buyers; if they inquire about a product, they're a viable lead — and often a sale."

Steve is sure about this because CIS tracks its leads with an in-house marketing system.

"We've found that Quantum RS generates a tremendous amount of interest, but CIS' sales department is dependent on the quality — not quantity — of responses. And we know Computerworld delivers quality — which added to Quantum RS' sales increase of 218 percent last year," Steve says.

One reason CIS has relied on Computerworld over the last two years is Computerworld's diverse coverage. "Computerworld covers the industry. Today's corporate DP shop is more of a mixed-vendor environment than it was in the past. In growing numbers, corporate users are utilizing IBM PCs and ATs for microcomputing and

DEC VAX systems for departmental and mainframe computing," notes Steve. "Based on this, we've found Computerworld to be a very effective vehicle to reach VAX users, especially in large DP environments."

Computerworld. We're helping more suppliers reach more buyers more often in the computer market. We cover the entire computer world. Every week. We deliver the news, the analysis, and the audience. Just ask Steve.

Call your Computerworld representative for all the facts. Or call Ed Marecki, Vice President/Sales, at (617) 879-0700.

VAX is a registered trademark of Digital Equipment Corporation.

IBM, IBM PC, AT are registered trademarks of International Business Machines.

BOSTON/(617) 879-0700. NEW YORK/(201)
967-1350. CHICAGO/(312) 827-4433.
ATLANTA/(404) 394-0758. DALLAS/(214)
991-8366. LOS ANGELES/(714) 261-1230.
SAN FRANCISCO/(415) 421-7330.

A PUBLICATION OF
CW COMMUNICATIONS

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

12 WEEKS \$44/YEAR

Trade bans... AT&T...

BUY - SELL - SWAP

1-800-426-USED

In California (714) 641-0366

IF IBM MAKES IT, WE CAN SAVE YOU MONEY

Series/1

System/34

System/36

System/38

43 XX

30 XX

- Top Savings
- Quick Delivery
- Short and Long-Term Leases
- All Models & Peripherals
- New & Used



Marshall Lewis

& Associates, Inc.

1536 Brookhollow Drive, Building A
Santa Ana, Ca 92705-5426

CDN Member Computer Dealers & Lessons Association

IBM SPECIALISTS

SELL • LEASE • BUY

\$/34 \$/36 \$/38
3741 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670

IN TENNESSEE (615) 847-4031



P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

IBM UNIT RECORD EQUIPMENT
DISK PACKS—DATA MODULES—MAG. TAPE—DISKETTES



SALE OR LEASE

NEW & USED
DISK PACKS—DATA MODULES
2316-3336(1)-3336(11)-3348(70)
MAG. TAPE—DISKETTES
Every Item Guaranteed

IBM UNIT RECORD MACHINES
026-029-082-083-084
085-087-088-129-514
519-548-557-188

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St.
Chicago, IL 60648
(IL-312-647-0880)

Who do you call on first for your data processing and telecommunications needs?

CMI SPECIALISTS

**3081, 3083
3084**

FOR SALE
OR LEASE

DEC

VAX 8200, 8300, 8600
8650, 8800
PURCHASE LEASEBACK

REGIONAL OFFICES
Laguna Hills, CA (714) 951-3200
Tampa, FL (813) 228-7000
LOCAL OFFICES
Absecon, NJ (609) 645-7282
Atlanta, GA (404) 256-7942
Boston, MA (617) 367-5755
Chicago, IL (312) 620-4400
Cleveland, OH (216) 292-8242

Dallas, TX (214) 869-3111
Encino, CA (818) 789-0113
Flemington, NJ (201) 782-3878
Houston, TX (713) 780-7459
Lebanon, TN (615) 449-6633
Miami, FL (305) 442-2968
Oceanport, NJ (201) 542-6776
Sacramento, CA (916) 443-7511

INTERNATIONAL OFFICES
Frankfurt, West Germany
Telex: 4170499
London, England Telex: 848980
Montreal, Quebec (514) 871-1121
Nyon, Switzerland Telex: 27209
Paris, France Telex: 214093
Toronto, Ontario (416) 928-3400
Vancouver, British Columbia
(604) 685-6196

CMI

CMI Corporation

CMI Financial Services Group
Headquarters
2600 Telegraph Rd./P.O. Box 2026, Bloomfield Hills, MI 48303-2026
(313) 456-0000/TWX 810-232-1667 CMI CORP. BDHS

Member ASCD and CDLA

no

NO DELAYS
NO INSTALLATION PROBLEMS
NO WORRIES
NO MIDDLEMEN
NO GUESSING
NO DISAPPOINTMENTS

WE BUY • SELL • LEASE
34 • 36 • 38 • SERIES 1 • 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPDATES
SOFTWARE & DATA COMMUNICATIONS CONSULTING

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879



COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
“SINCE 1974”



IBM SYSTEMS, PERIPHERALS, UPGRADES

**SYSTEM 36
SERIES/1
SYSTEM 38
SYSTEM 34
PC, XT, AT
4300/3080
DISPLAYWRITERS
DATAMASTERS S/23**

BUY, SELL, LEASE **612/894-2200** BUY, SELL, LEASE
ALSO: FINANCE & OPERATING LEASES FOR ALL SYSTEMS & PERIPHERALS

**Valley Computer
& Financial, Inc.**

12205 Nicollet Avenue, Burnsville, MN 55337

BUY SELL SWAP

GUARANTEED 3178 SAVINGS.

COMPARE OUR RATES.

CALL US NOW ... TOLL-FREE!

GREYHOUND CAPITAL

OPTIONS CORP SERVICE

BUY TOLL FREE 1-800-528-0358 ASK FOR KELLI EXT. 8806 SELL

Greyhound Capital Corporation

A subsidiary of The Greyhound Corporation

© 1986 Greyhound Capital Corporation

Sales Offices In:
Atlanta, Austin, Boston, Chicago, Dallas, Houston, Los Angeles, Minneapolis, New York,
Philadelphia, Phoenix, Pittsburgh, San Francisco.**IBM****BUY • SELL • LEASE****36****SERIES 1****4300****38****TEMPSEY**Processors
Peripherals
Upgrades

355 E. 3RD ST.

(714) 847-8486

**MISSISSIPPI CENTRAL
DATA PROCESSING AUTHORITY**

Signed proposals will be received by the CDPA office, 111 South Jackson Street, Suite 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1140, due Tuesday, September 23, 1986 at 3:00 p.m. for the acquisition of an upgrade or replacement of an existing automated network management system with associated modems, cabinets and cables for the STATE COMPUTER CENTER (see addendum).

Request for Proposal No. 1141, due Tuesday, September 23, 1986 at 3:00 p.m. for the acquisition of an expanded tape drive system for the Communications Services Department at the UNIVERSITY OF SOUTHERN MISSISSIPPI.

Request for Proposal No. 1142, due Tuesday, September 23, 1986 at 3:00 p.m. for the acquisition of a 32-bit multibus microcomputer to interface with VAX 11/780 microcomputer system. This equipment will be used in the Department of Computer Science and Statistics at the UNIVERSITY OF SOUTHERN MISSISSIPPI.

Request for Proposal No. 1143, due Tuesday, September 23, 1986 at 3:00 p.m. for the acquisition of a 32-bit multibus microcomputer capable of operating under the VAX/VMS operating system. This equipment will be used in the Department of Polymer Science and Chemistry at the UNIVERSITY OF SOUTHERN MISSISSIPPI.

Request for Proposal No. 1144, due Monday, September 15, 1986 at 3:00 p.m. for the acquisition of data entry services for the office of the SECRETARY OF STATE.

Request for Proposal No. 1145, due Thursday, September 17, 1986 at 3:00 p.m. for the acquisition of a maintenance agreement for microcomputer systems and peripherals for the MISSISSIPPI STATE DEPARTMENT OF EDUCATION.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and award contracts.

Lies Whistead @ (601) 359-2825
or Colleen Downing @ (601) 359-2824

ECONOCOM[®]

IS THE SOURCE FOR SERIES/1

- BUY
- SELL
- LEASE

NEW OR USED

ECONOCOM-USA, INC.
945 CROSSOVER LANE
P.O. BOX 246297
MEMPHIS, TN 38124
800-238-3098 or 901-767-9130

FOR SALE

2 Eastman Kodak Oracle Microfilmers 16mm

Accommodates 215-foot rolls of thin based film. Reduces up to 11 by 14" in size.

Call Rick at IDG
(617) 875-5000 (ext 452)

Sale/Lease Available Now

3081K 32x24

3083E 16x16

3083J 24x16

Call Ext. 401

(800) 821-0229

(818) 986-2411

In California

El Camino Resources

IF YOU'RE BUYING, WE'RE SELLING.



IF YOU'RE SELLING, WE'RE BUYING.

BM SYSTEMS Buy • Sell • Lease PERIPHERALS

(800) 331-8283

TOLL FREE

(213) 306-9343

CALIFORNIA

Ocean Computers, Inc.

6055 W. Manchester Ave., Ste 525

Playa Del Rey, CA 90293

Rentals Month to Month
**Terminal Controller
3174 1L and 1R**
Available Now - New From IBM
**Terminals 3191, 3193
Quantity 3180, 3178**
From Lease Base

Call Ext. 401
(800) 821-0229
(818) 986-2411
In California
El Camino Resources

3704

3705 3725

BUY • SELL • LEASE

Call Toll-Free
800 532-7532

In Minnesota Call 612/944-9161

Centron DPL Company
Member CDLA

**We Buy & Sell
DEC
Systems Components**

call: 713
445-0082
600 Kennedy St C22
Houston, TX 77060

COMPUTERWORLD

COMPUTERWORLD's paid circulation climbed to over 129,522 this fall. Folio 400 (Folio Magazine's study of trade publication performance) placed us first in total revenue. As the industry grows, so will COMPUTERWORLD. It will continue to offer the high quality news coverage and editorial content that has attracted its readers. What does that mean to you, our advertisers? Good news...in the form of wide exposure.

The Classified section of the newspaper is laid out in an attractive format and is easy to read. It offers classifications to solve a variety of problems:

**Position Announcements, Buy • Sell • Swap,
Software For Sale, Software Wanted, Time & Services,
Bids & Proposals, Business Opportunities, Real Estate,
Auctions, Positions Wanted, Seminars &
Conferences, Publications and The Bulletin Board**

So, as a nationwide publication, we give you the exposure you want. As a weekly publication, we give you the immediacy your advertisements need.

A number of Executive Reports and Product Spotlights are scheduled to run in COMPUTERWORLD during 1986. Each of these features will focus on one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are some of the topics the features will cover:

Executive Reports

- Sept. 22 - Communications Standards
- Sept. 29 - On-line Computing
- Oct. 27 - Decision Support Systems
- Nov. 17 - Systems Integrators

Product Spotlights

- Sept. 15 - Spreadsheets
- Oct. 6 - Hardware Roundup/Large & Medium-scale Systems
- Oct. 13 - Hardware Roundup/Small-scale Systems

COMPUTERWORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. The issue of September 15 will be closing September 5th. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

Our mailing address is

COMPUTERWORLD

**Classified Advertising
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171**

Or call for more information at
1-800-343-8474
or, in Massachusetts,
(617) 879-0700

BUY SELL SWAP

BUY SELL SWAP



Don't Sweat It!

Call The Professionals for ALL Your IBM®
Buy / Sell / Leasing Needs

SYSTEMS

800-433-4148

PERIPHERALS

**DANA
MARKETING, INC.**

California 213 212-3111 Connecticut 203 359-8040 Texas 214 437-9018

LEAS PAK INTERNATIONAL

BEST PRICE**BEST SERVICE****BEST DELIVERY**

WHETHER YOU BUY, SELL, OR LEASE

PRINTERS
AND
CRT'SS/34
AND
S/38SYSTEM 36 PROCESSORS
AND
DISK UPGRADESLARGE
INVENTORYLEASE
FINANCING

LEAS PAK INTERNATIONAL™

ONE SOURCE SOLUTION

2120 Forum Parkway, Bedford, TX 76021 Phone 817-267-2841
1-800-LEAS-PAK (In Texas: 1-800-722-7811)

*Buy *Sell *Lease *Rent

IBM. Displaywriters

5525 — OFFICE SYSTEMS
5219 — 5253 — 5258
6670 PRINTERS
SYSTEM/34/36

Up to 50% SAVINGS on
FACTORY RECONDITIONED**WANG**

WPS • OIS • VS Equipment
All equipment is covered by
the Wang Service Contract
Authorized Wang
Used Equipment Dealer

CDB FINANCIAL, INC.

3520 DILIDO ROAD
DALLAS, TEXAS 75228
7-POINTS SALES OFFICE
214-432-3810 Member: CDSA-NOMDA

REAL ESTATE

Vacant Computer Center Wanted

15-20,000 square feet of raised floor with room for expansion. Must be a free standing structure, not part of any other building or having other occupants. Must be ready for immediate use. Lease or purchase.

Reply to CW-B4825,
Computerworld, Box 9171,
Framingham, MA 01701-9171

AUCTIONS

ABSOLUTE AUCTION

by Secured Party

WORD PROCESSING SYSTEMS, INC.

111 Flint Rd., Oak Ridge, TN

SATURDAY, SEPTEMBER 6 10:00 A.M.

Computers (NEW) NEC Model 7710 Spin Writer; (6) Control Data Disk Drives Model 1204; (4) System III Philips Model P-40 Daisy Wheel Printer; (2) Adds Computer Screens & Keyboards; Cume wide track printer; Cume twin track printer; Seiko C.P.U.;

Word Processors (NEW) 7 Ziyad Paper Feeders; Data Mark Model 2000 Envelope Feeder; (10) Philips Model 1001 Portable Keyboard; Variety of Philips program disks; Assortment of Disk Drives; Wang & Philips printers.

FOR ADDITIONAL INFORMATION CONTACT

FURROW AUCTION COMPANY

P O Box 2087, Knoxville, TN 37901; (615) 548-3206

COMPUTERWORLD

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

A Perfect 10

The Integrated Services Of Comdisco, Inc.

1. Flexible customization leasing
2. Responsive service/quick delivery
3. Wide range of products & solutions
4. Experienced industry analysis since 1969
5. Comprehensive disaster recovery services—4300 to 3084
6. Complete data center relocation capability
7. Up-to-the-minute technical & market information—current and future
8. Customer visitations, conferences, & individualized consultation
9. Worldwide representation
10. Buy/Sell/Lease entire IBM product line—PC's to 390s

Whatever your requirements, Comdisco is the only company that offers a turnkey approach to new technology. Contact your Comdisco Marketing Representative to learn how this 10-point strategy can benefit you and receive the latest Comline Reports on topical DP issues.

Eastern Region

Connecticut*	203/655-1211
Carlstadt, NJ	201/896-9500
Washington, DC	301/441-1000
Philadelphia, PA	215/545-8035
Boston, MA	617/542-4005
Red Bank, NJ	201/842-5111
Pittsburgh, PA	412/279-4074

Mid-Atlantic Region

Chicago**	312/698-3000
Michigan	313/644-1500

Western Region

San Francisco	415/944-1111
Los Angeles	213/436-7757
Denver	303/770-5555

South Central Region

Dallas*	214/641-3256
---------	--------------

Houston, TX	713/445-1815
-------------	--------------

Atlanta, GA	404/256-5956
-------------	--------------

Florida	305/428-3177
---------	--------------

Canadian Region

Toronto*	416/968-7135
Montreal	514/354-2110
Vancouver	604/222-3323

*Regional Headquarters

**Corporate Headquarters

We Specialize In:	4300
3880 3881 3420 3090 3480	
3370 3803 3375 3178 3360	
3705 3725 3800 S/36 S/38	

FREE
Comline
Reports
now available
on cassette.



Comdisco, Inc., 6400 Shafer Court, Rosemont, Illinois 60018

BIDS & PROPOSALS

REQUEST FOR PROPOSALS FOR HANDHELD COMPUTER SYSTEM

The Department of HOUSING PRESERVATION AND DEVELOPMENT, CITY OF NEW YORK, is interested in obtaining proposals for a Handheld Computer System consisting of 25 handheld units, an appropriate host computer and peripherals. This system will be used by inspectors in the Department's Division of Code Enforcement to report and record field inspection data. The proposal must include all software and hardware and be presented as a Turn Key Operation.

The handheld computers must have the capacity to store alphanumeric housing data, and to receive and transmit it via telephone or cellular communication with a main computer. The handheld computer must be equipped with a relational database and must be capable of two-way communication with both the handheld units and the Department's mainframe computer. The system, which will be used by the Department for a pilot test of this technology, will be implemented using 20 inspection teams assigned to the Brooklyn Heat Squad.

The Request for Proposals may be obtained in person or by mail from the Office of Real Estate and Maintenance (Attention: Ethan Williamson, Project Director), 100 Gold Street, Room 8133, New York, N.Y. 10038. Proposals must be submitted at this address no later than 5:00pm, October 10, 1986. A conference will be held on September 19, 1986 at 100 Gold Street, Room 9169, at 11:00am.

Make your call for
BIDS & PROPOSALS
here in
COMPUTERWORLD

Call
1-800-343-7474
or, in Mass.,
(617) 879-0700

NOTICE OF REQUEST FOR PROPOSAL

The Parking Violations Bureau of the New York City Department of Transportation is soliciting proposals for the operation and maintenance of a new data processing system (the "STAR System").

A copy of the Request for Proposals can be purchased for \$25.00 (cash or certified check) from the Contract Purchase Section of the New York City Department of Transportation, Room 1017, 40 Worth Street, New York, New York 10013, Monday to Friday, between 9:00 a.m. and 3:00 p.m.

Proposer's Conferences are scheduled at the Parking Violations Bureau, 770 Broadway (at East 9th Street), 15th floor, New York, New York at 11:00 a.m. on Tuesday, August 19, 1986, Tuesday, August 26, 1986 and Tuesday, September 2, 1986.

Proposals are scheduled to be submitted to the Contract Purchase Section of the New York City Department of Transportation, Room 1017, 40 Worth Street, New York, New York 10013, on September 22, 1986, no later than 11:00 a.m.

DEPARTMENT OF SOCIAL SERVICES

ATTENTION COMPUTER MAINFRAME MANUFACTURERS AND THIRD PARTY VENDORS

The New York City Human Resources Administration/Office of Data Processing (HRA/ODP) is seeking proposals for permanent acquisition of one mainframe computer (6.0 MIPS, 520 megabytes main storage, 12 channels, air-cooled, 60 cycle power, machine cycle time 56 nsec, 64k buffers), two command console console terminals and a console printer. The system will be fully compatible with HRA/ODP hardware and software.

Proposals will be received by the Human Resources Administration/Office of Data Processing until 5:00 P.M. Monday, September 15, 1986.

A Proposer's Conference will be held on 10:00 A.M. September 2, 1986 at the Office of Data Processing, 111 Eighth Avenue, 8th Floor, New York, NY 10011. Attention: Delta King, Telephone No. (212) 206-3746.

Request for Proposals may be obtained beginning 9:00 A.M. on August 25, 1986 from the HRA Office of Data Processing, 111 Eighth Avenue, 8th Floor, New York, NY 10011. Attention: Delta King, Telephone No. (212) 206-3746.

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- SOFTWARE WANTED
- TIME & SERVICES

- REAL ESTATE
- BUSINESS OPPORTUNITY
- SEMINARS/CONFERENCES
- BIDS AND PROPOSALS

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (telecopier service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

**Ad closing is every Friday,
6 working days prior to issue date.**

Rates: Open rate is \$161.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$323.40 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

1 col X 4" - \$ 646.80
2 cols X 4" - \$1293.60

2 cols X 5" - \$1617.00
2 cols X 8" - \$2587.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, \$15 per insertion. To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
or (800) 343-6474

San Francisco (415)421-7330

TELECOPIER SERVICE - (617) 879-0700 or (800) 343-6474
ext. 451 or 410

Cynthia J. Delany, Classified Operations Manager

The Bulletin Board

Buy • Sell • Lease

DATA GENERAL

NPA SYSTEMS INC.
for the SALE, LEASE,
PURCHASE & SERVICE OF
DATA GENERAL EQUIPMENT
CALL
(516) 487-2500 (115) 848-8835
(NEW YORK) (CALIFORNIA)
DISASTER PLAN & FACILITY
MANAGEMENT ALSO AVAILABLE

PRINTERS

Dataproducts
B-1000 \$7,800
B-610 \$5,200
M-200 \$1,800
American Computer Hardware
(714) 549-2688

HONEYWELL

HONEYWELL SPECIALISTS
LEVEL 6 DPS 6 SERIES 16
The Recognized Leader
In Honeywell Minicomputer
Sales And Support
Commercial Minicomputer Line - New
and Used
• All Peripherals and Terminals
Upgrades and Features
Documentation Available
• Honeywell Maintenance Guaranteed
• Immediate Delivery - Low Prices
** Lease Special - Immediate Delivery **
MSU 910/1000/2000/256 Mb Disk in Color
w/Coloring 017-393-6839
TWX 710-347-7574
Boudreau Computer Services
500 Main St.
100 Bearfoot Rd.
Northboro, Massachusetts 01532

PRIME

TBI - the oldest, largest and most ex-
perienced supplier of third party per-
ipheral accessories and controllers for
Prime users.
BUY • SELL • LEASE • RENT
NATIONAL FLORIDA 800-421-4135
Timesharing Services, Inc., 4080
Woodcock Dr., Jacksonville, FL 32207

LARGE SELECTION OF USED
PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
2001 EAST CAMPBELL AVE.
PHOENIX, ARIZONA 85016
(602) 957-0999
ASK FOR DON

MISC.

PYRAMID-90X
90X, 2 MB, 18 ports, 450 MB drives,
1600 BPI streamer tape, manuals (1½
yrs. young), \$66,500.
Immediate delivery
Call Gerrit Rogers
(800) 722-0700 (215) 822-6778

AT&T-3B2-310
MAU, 102 MB disk, floppy, 1/4
inch tape, 6 ports, 1 parallel port,
modem port monitor, \$19,700.
Immediate delivery
Call Gerrit Rogers
(800) 722-0700 (215) 822-6778

QANTEL

BUY SELL LEASE
QANTEL/NEC
CALL PROMPT COMPUTER
Dan Koble
(216) 248-2898

HEWLETT PACKARD

HP3000
BUY • SELL • RENT • LEASE
Processors • Peripherals • Systems
ADCC Special
ADCC (4 Ports) For S/4X
\$800
With Honeywell
2 Or More Terminals
Immediate Delivery
Subject to Availability
Guaranteed to Quality
for HP Maintenance
ConAm Corporation
(800) 643-4954 (213) 829-2277

HP 3000 • 1000
9000 and now 250
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756927

The Bulletin Board

WANG

-IN STOCK-
 • WANG 2265V-2 (6565-2)
 Guaranteed \$10,500 Ea.
 • 620Mb For VS Systems
 2265V-2 Config. \$10,900 Ea.

• WANG OIS 140-3
 \$7,900 Ea.

-WANTED-

WANG VS-90 Processors Best \$
 WANG DW/OS/2 Printers
 WANG 4200 Series Term's
 Toll Free 800-327-2426
 In Mass (617) 372-3536
CFR Systems/Service
 Since 1975

WANG

**THE RIGHT EQUIPMENT
 RIGHT NOW
 AT THE RIGHT PRICE
 ICA...THE RIGHT CHOICE**

founded 1981 by ex-Wang employees
 (404) 977-4388 or (800) 241-3159

**BUY IN CANADA
 WHERE YOUR U.S.
 DOLLARS GO FURTHER**

Systems and Peripherals
 Buy and Sell
 Guaranteed For Wang Maintenance
 2470 Windy Hill Road, Suite 253
 Marietta, GA 30067
 Call: Richard Holley or Carole Benzon
 (404) 980-1700

416-738-0803 or 416-736-1056
 Telex # 0998678 TOR

WANG

**BUY - SELL
 MVP/LVP • OIS • VS • PC
 SYSTEMS INVENTORY
 VS-45 • OIS • VS-100
 GENESIS
 EQUIPMENT MARKETING
 (602) 277-8230**

HOLSON ASSOCIATES, INC.

Authorized
 Wang Used Computer Dealers
 Buy and Sell
 Guaranteed For Wang Maintenance
 2470 Windy Hill Road, Suite 253
 Marietta, GA 30067
 Call: Richard Holley or Carole Benzon
 (404) 980-1700

**VS • OIS • PC
 AUTHORIZED WANG
 EQUIPMENT DEALER**

CALL OR WRITE TODAY
 (617) 547-1113 or (800) 447-1158

E.L.I. SYSTEMS INC.
 139-145 HAMPSHIRE STREET
 CAMBRIDGE, MA 02139

IBM

IBM

34-38-38
 Systems,
 Peripherals & Upgrades
 Guaranteed Quality Service
 Same Day Repair Services
 New and Used Equipment
Carlyn Computer Systems, Inc.
 800-928-4227
 In VA (703) 642-1950

4361, 4381

All Models Available
 Call Russ Schneider
 800/426-4341
 In CA 408/241-3677

Marketex Computer Corp.

DISKCO MARKETING CORP.

BUY & SELL
 Displaywriters

34's, 36's, 38's, 4300's

Call 1-800-325-4443
 in Texas 800-797-1823
 4910 Frankfort Ave.
 Lubbock, TX 79424

S/38

Mod 5, Mod 8, Mod 18
 Immediate Availability

Must Sell Or Lease

Source Data Products
 800/328-2688 415/328-3333

Call Bob Lossey

SALE/LEASE

S/38

5381-6G1 Processor
 5382-F01 Processor
 5383-9Y4 Processor
 3320-A1 Disk
 3430-A1 Tape & Ctl.
 3430-B1 Tape

Call Ron Gibb (914) 238-9631

Call Bill at (301) 984-3348

S/38 S/36 S/34

SERIES 1

BUY - SELL - LEASE

Systems, Peripherals & Upgrades

Source Data Products

800/328-2688 415/328-7333

SALE/LEASE

S/36

Model B Or C

With Or Without Peripherals

Call Louis Felder (914) 238-9631

Computer Merchants Inc.

FOR SALE/LEASE

3880-003's

3380-AA4's & B04's

Bluebonnet Computer Co.

(512) 982-3900

The Bulletin Board

IBM

WANTED

3762-1

Payment Transistor Processor
 With Features # 131, 3805,
 4660, 5103 & 7500

Call Matt Blaustein
 (914) 238-9631

Computer Merchants Inc.

\$138,500.00

DEC VAX 11/785 XA-AE

VMS Lic., 16MBS National Memory,
 TEU/77 Tape Subsystem, Eagle 474
 MB Disk, SC750 disk controller,
 CS21-F 32 port MUX, 3Com
 ethernet interface, LA120 console,
 DEC Maintained.

\$138,500.00

DEC VAX 11/750 XA-AF

UltraVMS Lic., 4MBS MOS memory,
 TUR-1000 BPI tape subsystem, Eagle
 474MB disk, SC750 disk controller,
 CS21-F 32 port MUX, 3Com ethernet
 interface, LA120 console, DEC Main-

tained.

\$38,500.00

Immediate Delivery

HIGHLAND DIGITAL

Call Scott at (415) 941-2232

MISC. SYSTEMS

STC Equipment

1500 Printer \$2,000

3800-4 Tape Crtr \$2,000

3670 Mod 8 \$1,000

Call Richard At

Gramco (512) 696-4030

For Sale or Lease

FORTUNE 32-16

6 Systems Available

Each System has 6 FIT Terminals

Many Disk

Upgrades (302 & 85 MB)

Call Bill at (301) 984-3348

DEC

DEC

SUMMER SIZZLERS

11/44 CPU Set KD112.....\$3,900

HSC5X-C4 \$5,700

KU785 WCS \$3,700

MP720-M \$4,400

MS630-BA \$1,500

MS630-BB \$2,100

MS750-CA \$1,200

MSV11-OC \$1,250

MSV11-LQ \$5

MSV11-PL \$540

VAX 730 CPU KIT \$4,400

VAX 750 CPU KIT \$8,900

VAX 4MB MS780-JD \$3,400

VAX 4MB MS86-BA \$8,600

QEL, Inc. (800) 331-8140 (817) 275-0800 (504) 641-6140

New (800) 331-8140 (817) 275-0800 (504) 641-6140

Merida Trading Group
 151 New Boston Street

Webster, Mass 01801
 (617) 933-6790

In House Ready To Ship

New VAX 750FA \$35,000

No VME License

Quantity 1144ADA \$9,500

New (817) 933-6780

Planning to buy non-DEC memory?

Check our DEC memory prices first!

11/44-1000 CPU \$1,200

BC26V-50 H9642-AP MS750-CA

DH11-AP H9642-AS MSV11-JC

DLV11-J MS11-PB MSV11-PL

NEW YORK COMPUTER EXCHANGE

(516) 252-8666 (800) 645-9109

BUY • SELL • TRADE

Planning to buy non-DEC memory?

Check our DEC memory prices first!

11/44-1000 CPU \$1,200

BC26V-50 H9642-AP MS750-CA

DH11-AP H9642-AS MSV11-JC

DLV11-J MS11-PB MSV11-PL

EXCELLENT SERVICE LEVELS

COMPETITIVE RATES

VOLUME DISCOUNTS

BURNS COMPUTER SERVICES, INC.

MIDWEST: EAST COAST:

312/691-5260 212/386-3900

212/432-1151

MILLENNIUM is a registered trademark of McCormack & Dodge

NOMAD2 is a trademark of DEB Computing Services, Inc.

TSO/SPF

CICS

IMS/DBDC

RJL

TELENET ACCESS

Info Center Products

Access By Micras

EXCELLENT SERVICE LEVELS

COMPETITIVE RATES

VOLUME DISCOUNTS

BURNS COMPUTER SERVICES, INC.

MIDWEST: EAST COAST:

312/691-5260 212/386-3900

212/432-1151

MILLENNIUM is a registered trademark of McCormack & Dodge

NOMAD2 is a trademark of DEB Computing Services, Inc.

TIME & SERVICES

ICOTECH

Information Computer Techniques
 DATA PROCESSING SERVICES
 IBM 3081 DEC-10 VAX 8600

• Batch Processing
 • TimeSharing
 • Microfile
 • Public Network Access
 • Laser Printing
 • Optical Mark Reading

Introducing ...

the ICOTECH

Health & Safety

Information System
 Route 202 • Raritan, N.J. 08869
 1-485-3400 • Contact: Joyce Bogenske

TAPE/DISK RECOVERY
 You know it's there
 but you can't access it.
 Our specialty is
 getting data back for you.
404-438-0033
 CREATIVE SYNERGY

COMPUTER
 TIMESHARING

We broker computer time.
 All mainframes.
 Nationwide Service.
 NEVER a charge to the Buyer.
 Our fees paid by the Seller.

Call Don Seiden at
 Computer Reserves, Inc.
 (201) 688-6100

DEC SPECIALISTS

VAX 8600 & PDP-11
 TIME SHARING

NO CPU CHARGES

\$7/\$10
 VMS
 RSTS/E
 PER HOUR CONNECT TIME

BUDGET BYTES®
 212-494-9230
 EXT. 110

TIMESHARING

GENERAL CONSULTING

SOFTWARE DEVELOPMENT

FACILITIES MANAGEMENT

COMPUTER EQUIPMENT & SUPPLIES

HARDWARE MAINTENANCE (NY METRO AREA)

MEDIA CONVERSION

EXECUTIVE SEARCH

SOLONOM ACCOUNTING SOFTWARE

Omnicomputer, Inc.
 1430 Broadway, New York, N.Y. 10018

DATA CENTER
 SERVICES

* MILLENNIUM

* OS/MSV/SP

* VM/370

* DOS/VSE/SCP

* CMS

* TSO/SPF

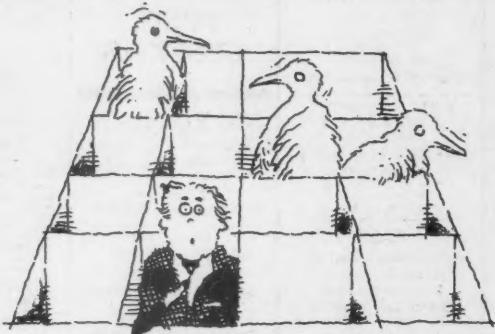
* CICS

* DB2

* DB2/400

Tell Us About The TIME & SERVICES
 You Have To Offer...Here In
 COMPUTERWORLD's Classified Pages.

POSITION ANNOUNCEMENTS



If you're not a pigeon, why do you live in a pigeon hole?

You know how easy it is to get 'pigeon-holed' in the career game. But what if you want to explore new options, try new things?

TRW's Information Services Division (ISD), a major marketer of leading edge business and consumer credit information software products and services, invites you to move out of that pigeon hole and into a company that sees you as an individual — a company that wants you to reach for new interests and expand your technological territory.

Communication Engineering Specialist

We need a highly experienced professional with a take-charge workstyle, to contribute to the design, performance and capacity planning of our data communications facilities. You'll work closely with other engineers and technical staff to develop all procedures, process systems and information used in the planning of real-time, historical and predictive analysis. Good analytical skills and familiarity with monitoring/modeling tools will enable you to forecast needs and predict upgrades as necessary.

Qualified candidates will have 7 years experience in the design/implementation of large data communication systems which includes at least 2 years in a performance/capacity planning role. Your background should include statistical analysis, data network programming/reporting, as well as packet network, SNA and other IBM-supported protocols.

Our salaries and benefits are superior — because we want to attract the best. If you're tired of a pigeon hole — fly a resume our way.

TRW
Information Services Division
Professional Employment
Dept. CW91
505 City Parkway W.
Suite 300
Orange, CA 92688

An equal opportunity employer.



"Heart of the Southeast"
Explore the exciting career opportunities in the growth center of the Southeast. The professional challenges and quality of lifestyle cannot be surpassed.

IMS DB/DC
TANDEM
ADABAS
MVS-XA
HONEYWELL

CANIM
IDS
LIFE/70
4th GENERATION
UNIVAC

FOCUS
EDP Recruiters
3 Corporate Square, Suite 340
Atlanta, Ga. 30329 (404) 321-5400
out-of-state call
1-800-423-1989-2236

COMPUTER OPERATIONS MANAGER

A large Boston based professional firm is seeking an Operations Manager for their Data Processing Department. Primary responsibilities of this position include:

- Act as assistant to the Data Processing Manager.
- Manage all computer room operations and staff.
- Management of computer supplies and forms purchased.
- Responsibilities for personnel and staff development of operations personnel.
- Act as liaison to the firm's various hardware vendors for negotiation/ acquisition of hardware maintenance agreements.

Qualifications for this position include BA/B.S. degree, at least 8-10 years of experience in a Computer Operations/Technical Support environment, including computer management experience in the Computer Operations section. Effective communications skills with both operations staff and computer systems users are required. Experience using VMS and Unix environments will be a definite plus. Send resumes to CW-84821, Computerworld, Box 9171, Framingham, MA 01701-9171. Unix is a trademark of AT&T Bell Labs

PROGRAMMER/ANALYST

For A PRIME Information System

We need a strong Application Programmer with at least 3 years experience on Prime Computers to develop software on our Prime 9955 with the Information Operating System. Your responsibilities will include design and implementation of our new systems, enhancement of existing systems and interacting with our documentation and communication personnel.

We offer a corporate commitment to leading edge technology, exciting R & D atmosphere, a great location to work and excellent benefits.

For prompt consideration, send your resume and salary history to:

Systems Software, Inc.
P.O. Box 1811
Santa Cruz, CA 95061
Attn: Glen Livingston

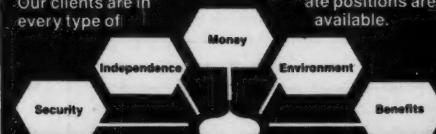


Great Compensation State of the Art Environment Independence Security Benefits

These are the elements that make up the ideal position for the professional programmer.

At CGA, we have been matching dynamic elements like these with highly qualified, confident, and motivated people for twenty years.

Our clients are in every type of



CAP GEMINI AMERICA

Suite 365
3401 Park Center Drive
Dayton, Ohio 45414
(513) 890-1200
1 (800) 543-7583
Equal Opportunity Employer

Sub-Contractors Welcome

GREATER BOSTON

Boston's thriving economy provides excellent career opportunities for experienced MIS professionals, and Eastern Massachusetts has always offered an outstanding year-round quality of life.

For 20 years ROMAC has been a leader in the placement of MIS professionals.

Contact us today - career opportunities in the \$25-60,000 range.

ROMAC.
20 Walnut Street, Dept. C
Wellesley Hills, MA 02181
617-239-0900

San Francisco

CRG treats you like the Software Pro that you are

We respect your needs, protect your good name, and help you achieve your goals. Software Pros and Bay Area businesses have given us their trust and respect for the past 15 years. Call today or mail your resume to Computer Resources Group, Inc., 303 Sacramento St., San Francisco CA 94111. (415) 398-3535, or 3080 Olson St., Santa Clara CA 95054. (408) 727-1658.

The Computer Resources Group, Inc. AFFILIATES IN 27 MAJOR CITIES
Silicon Valley

MANAGER SYSTEMS AND PROGRAMMING

St. Louis based application software development firm with international clientele seeks manager for software development activities.

Firm develops and maintains sophisticated fourth generation tools and financial management applications for cross-industry use.

The ideal candidate will have:

- Computer Science or EE degree
- Excellent analytical capabilities
- Experience in C language & mini-computers
- Proven management skills

Send resume, including salary history, in confidence to: Box #CW-84824, Computerworld, Box 9171, Framingham, MA 01701-9171.

Programmer/Analysts

Young, growing DBMS consulting company is seeking self-motivated professionals with experience in any of the following areas

**MODEL 204 DBMS
DATACOM DBMS/IDEAL
ORACLE
WANG VS SYSTEMS/PACE**

For challenging positions in a variety of environments and educational opportunities in the latest DBMS technologies, send resume to:

INNOVATIVE DIRECTIONS, INC., 847 Fansone Street, Suite 300, San Francisco, CA 94111 or call (415) 397-8500

POSITION ANNOUNCEMENTS

CONSULTING... AN ACQUIRED KNOWLEDGE

Why Not Consulting?

CAP GEMINI AMERICA — the fastest growing data processing consulting power — enjoys an enormous list of clients both in America and abroad that is steadily satisfied by our imaginative and innovative leading edge approach in consulting. We presently have concrete opportunities available in **Denver, Chicago, St. Louis, Omaha and Des Moines** for creative-thinking professionals stimulated by challenge and unlimited consulting career fulfillment.

These positions require a minimum of two years progressive experience in any of the following:

IMS, IDMS, ADS/O, ADABAS/NATURAL, SYSTEM/38, DBII, PL1, CICS, DATACOM, IDEAL, HARRIS 500, HOGAN, BURROUGHS

Why Not The Best?

Our working environment is structured to supply what professionals demand — the opportunity to grab the challenges and advance into the future. Salaries are competitive, and our liberal benefits program includes in-house technical training, paid overtime, medical/dental/vision/life insurance.

CGA has a clear vision of where it is going...and who it needs to maintain its uppermost stance in the DP industry. We are in search of professionals like you. Call or forward your resume with salary history for immediate and confidential consideration.

SUB CONTRACTORS WELCOME

CAP GEMINI AMERICA

Midwest Regional Office
John Perrotta (312) 296-9600
1011 E. Touhy Ave., Des Plaines, IL 60018
equal opportunity employer m/f

BOSTON

Software Project Leader and SAS Applications Programmers

We are a software development and consulting firm recognized as a leader in the health care cost control field. We have several exceptional opportunities for individuals who, through experience and education, are able to meet the challenge of working for an industry leader.

SOFTWARE PROJECT LEADER

Requirements include 3-5 years' experience supporting IBM mainframe software products. Assist in software sales with technical demos and training. Function as client interface for data processing, supervise release control and support programmers.

SAS APPLICATIONS PROGRAMMERS

Requirements include CS or MIS degree and 1-3 years' experience with IBM environment. Knowledge of SAS, JCL and work with large data sets plus.

Reply to CW-B4827, Computerworld, Box 9171, Framingham, MA 01701-9171

Resumes must include salary history.

Principals only.

An Equal Opportunity Employer

SOFTWARE DEVELOPMENT MANAGER

Well established Bay Area Software firm is seeking a take-charge product Development Manager for its IBM System/3X product line. You should have these qualifications: extensive competence in S/36 SSP, RPG II (S/36 Assembler a plus); On S/36 CPP, RPG II (P1 & I plus); people and project management experience; familiarity with the System 3X market and its products; an awareness of marketing requirements and competitive analysis. We are looking for leadership, creativity, and perseverance.

We offer excellent compensation, benefits, working conditions and a challenging marketplace.

Please submit detailed resume to:

Eric R. Looe
 Vice President, Research and Development



4000 Civic Center Drive
 San Rafael, CA 94903
 PRINCIPALS ONLY PLEASE!

CONSULTING... AN ACQUIRED KNOWLEDGE

Why Not Consulting?

CAP GEMINI AMERICA — the fastest growing data processing consulting power — enjoys an enormous list of clients both in America and abroad that is steadily satisfied by our imaginative and innovative leading edge approach in consulting. We presently have concrete opportunities available in **Denver, Chicago, St. Louis, Omaha and Des Moines** for creative-thinking professionals stimulated by challenge and unlimited consulting career fulfillment.

These positions require a minimum of two years progressive experience in any of the following:

IMS, IDMS, ADS/O, ADABAS/NATURAL, SYSTEM/38, DBII, PL1, CICS, DATACOM, IDEAL, HARRIS 500, HOGAN, BURROUGHS

Why Not The Best?

Our working environment is structured to supply what professionals demand — the opportunity to grab the challenges and advance into the future. Salaries are competitive, and our liberal benefits program includes in-house technical training, paid overtime, medical/dental/vision/life insurance.

CGA has a clear vision of where it is going...and who it needs to maintain its uppermost stance in the DP industry. We are in search of professionals like you. Call or forward your resume with salary history for immediate and confidential consideration.

SUB CONTRACTORS WELCOME



CAP GEMINI AMERICA

Midwest Regional Office
John Perrotta (312) 296-9600
1011 E. Touhy Ave., Des Plaines, IL 60018
equal opportunity employer m/f

SENIOR PROGRAMMER ANALYSTS

- Multiple IMS/PL-1 and CICS COBOL positions
- Fortune 500 Clients
- Relocation assistance
- Dallas location
- Salary to 45K

BROOKS, WEITZEL & ASSOCIATES

Executive Search
 Consultants for the
 Data Processing Industry

5757 Alpha Rd., Suite 502
 Dallas, Texas 75240
 (214) 387-3300

System Management/Programming

VAX 8600/785
 VME VAXcluster

Medical Research Environment

Academic computing on the Medical College of Virginia Campus of Virginia Commonwealth University is seeking applications for the position of Senior Programmer Analyst. Responsibilities include system analysis, design, and programming. Need a technically strong individual to join a group of professionals working in a stimulating environment. College degree preferred. Computer science major or engineering major in computer science desired. Extensive knowledge of languages such as Pascal, FORTRAN, and Assembly highly desirable. Some experience with UNIX also desired. VAX/VME experience highly desirable. Starting salary: \$26,602 to \$31,263. Submit a resume for position number 50898 by September 21, 1986.

University Personnel
 1000 East Marshall Street
 Richmond, Virginia 23298

For more information call (804) 786-9843

VCU is an Equal Opportunity
 Affirmative Action Employer
 Women and Minorities
 are encouraged to apply

PROGRAMMER/ ANALYST

Location: Albany, NY
 The information services group of a NY agency has several Programmer/Analyst openings. Starting at \$32,628, salaries will be commensurate with experience. Individuals with 3+ yrs of experience and some experience with a IBM PC/PM/ADS/ADS are invited to submit resumes detailing their exp:

- 1) Installing the system.
- 2) Bringing it into an operational environment.
- 3) Developing its enhancements.

Resumes should be postmarked no later than Sept 15 & addressed to:
PERSONNEL, SECTION DL
 44 Holland Ave, Albany, NY 12229

An Equal Opportunity/
 Affirmative Action Employer

RESEARCH STAFF MEMBER: Dev & implement theory & algorithms in math programming to determine practical approaches to solve problems in modeling tools, matrix generation, large systems, optimization methods for solving linear programs, integer programs, & special structured linear programs w/program dev groups & users in joint effort. Must have experience in dev modeling tools & matrix generation, & solving linear programs. Must have level k/math programming theory, algorithms exp in dev modeling tools & matrix generation, & solving linear programs. Must have level k/matrix programming theory, algorithms exp in dev modeling tools & matrix generation, & solving linear programs. Must have proven analytic & experimental abilities as well as exp in dev H performance, stability, reliability, and maintainability as evidenced by publications. Must be able to effectively communicate results of wrk for int'l & xtrn presentation & publication. Msc Eng Sci/Soc/Opns Res, or equivalent exp in job & 5 yrs exp in dev of large scale commercial math programming software systems req'd. 40 hr/wk; 8:00-4:45pm; \$63,000/yr. EOE. Resume to: NYS Job Svc, 55 Church St., White Plains, NY 10601, inc JO#0793202, DOT 020.067.016

BRADLEY UNIVERSITY PROGRAMMER/ANALYSTS

HELP THE FUTURE HAPPEN: We need Programmer/Analysts to help us develop and maintain the Administrative Systems which support Bradley's mission of learning. These are full-time annual appointments with excellent benefits and salaries commensurate with training and experience. Bachelor's Degree and experience in Systems Design and Control, VME/VAX cluster, VMS, DEC Control Data Cyber 180 Series equipment and a University environment would be a plus. Send resume, names of three professional references, and salary history to: Michael Yoho, Director, Computer Center, Marquette Hall, Bradley University, Peoria, IL, 61625. Applications accepted until positions filled. Send resume for consideration send application and other requirements by September 15, 1986.

An Equal Opportunity/
 Affirmative Action Employer

MIS DIRECTOR

Large firm in the distribution business is looking for a key individual to assume responsibility for Systems and Programming. Computer Operations and Communications.

The well rounded individual should have a degree in Computer Science or Business; be experienced in manufacturing or distribution; be skilled in management, planning, production, management and computer operations. The candidate selected must have demonstrated strong management and communication skills in previous positions.

Experise in voice and data communications, consultant planning, budgeting, financial systems and hardware with MVS would also be extremely valuable.

Please forward resume and salary requirements to:

Box #CW-B4828
 Computerworld
 P.O. Box 9171
 Framingham, MA 01701-9171

ENGINEER, Computer Design: Review & analyze customer specs; design & dev. computer vision systems & support software for process; instruct users. Must have B.S./Computer Studies + 2 yrs exp in Computer Design Applications Engg OR Mechanical w/ min grad postgrad exp. Must have strong background in microprocessors & assembly languages, & customer support. Must know PASCAL or FORTH. Salary: \$34,000/yr. View Engng. Job & interview in Simi Valley, CA. Please send resume to:

CW-B4823
 Computerworld, Box 9171
 Framingham, MA 01701-9171

System (Software) Engineer for Midwestern Consulting firm to develop software components to be used in a computer communication system. When the end result enables different computers to talk with each other, it exchange information according to Consultative Committee on International Telephone and Telegraph (CCITT), International Standard Organization (ISO) and American National Standards Institute (ANSI) standards. Responsibilities include development of the transport layer and session layer to conform to ISO protocols, conduct research on computer interfaces required for various telecom and other projects requiring the same ISO protocols. Requires MS in Computer Science and 5 years experience as Programmer, Information Systems. Academic program must have included at least: 1 course each in computer networking, ISO protocols, computer protocols, speech recognition, computer architecture, hardware, basic statistical theory, stochastic model theory; 4 courses on computer operating systems, 2 courses on computer programming system and 2 courses for the C programming language; and 1 programming course using the C programming language and the UNIX operating system. 40 hours per week. \$30,000/yr. Qualified applicants should send resume to this ad to B. Phillips, JO #3028615, Ohio Bureau of Employment Services, P.O. Box 1616, Columbus, Ohio 43216.

Programmer Analysts COBOL, CICS

A dynamic, state-of-the-art computer facility seeks individuals with 3 to 5 yrs. of programming and on-line systems experience. Must have COBOL, CICS command level experience. Environment consists of IBM 4381 operating under VM/CMS and DOS/VSE with CICS, VSAM, ACFTV/INCP, CSP, PROFF, SQL. Ability to work well with users and operational personnel.

Attractive salary and excellent benefits for qualified individuals. Relocation assistance available. Send resume not later than September 11th to Director of Personnel.

MUST HAVE COMPLETED AT LEAST 20 HOURS OF STUDY IN STATE MACHINE DESIGN.

SALARY: \$32,000 per annum. LOCATION: BELLEVUE, WA.

EEO/AA Employer

System (Software) Engineer for Midwestern Consulting firm to develop software components to be used in a computer communication system. When the end result enables different computers to talk with each other, it exchange information according to Consultative Committee on International Telephone and Telegraph (CCITT), International Standard Organization (ISO) and American National Standards Institute (ANSI) standards. Responsibilities include development of the transport layer and session layer to conform to ISO protocols, conduct research on computer interfaces required for various telecom and other projects requiring the same ISO protocols. Requires MS in Computer Science and 5 years experience as Programmer, Information Systems. Academic program must have included at least: 1 course each in computer networking, ISO protocols, computer protocols, speech recognition, computer architecture, hardware, basic statistical theory, stochastic model theory; 4 courses on computer operating systems, 2 courses for the C programming language; and 1 programming course using the C programming language and the UNIX operating system. 40 hours per week. \$30,000/yr. Qualified applicants should send resume to this ad to B. Phillips, JO #3028615, Ohio Bureau of Employment Services, P.O. Box 1616, Columbus, Ohio 43216.

SYSTEMS PROGRAMMER

Major St. Louis corporation seeks experienced Systems Programmers with 2+ years experience in either IBM VM or DEC VAX VMS. Must support operations in various software environments in manufacturing and engineering areas. Excellent benefit packages in relaxed environment. Salary: \$46,000.

ROBERT WILKF
 DATA PROCESSING
 7733 Foothill Blvd.
 St. Louis, MO 63105
 (314) 727-1535

Engineer, Interface Project

(DOT 019-167-014) - Design and implement intelligent computerized communications and data transmission systems to support international financial markets in US, Europe, Asia and the Middle East; test software and hardware for systems utilizing CCITT, IEC, FCC, UL and Bell telephone communication standards. 40 hours per week. \$44,100 per year. Requires MS Electronics Engineering, four years job experience as engineer in design and development of CCITT, IEC, FCC, UL and Bell telephone communications and telecommunication standards. Send resume to New York State Job Service, State Building, Veterans Memorial Highway, Hauppauge, New York 11788. Job Order # 0604514.

**University Of Notre Dame
User Services
GRAPHICS CONSULTANT/
ANALYST**

Duties include consulting, documentation, minicomputer, and software selection, with emphasis on mainframe and micro graphics hardware and software. Current mainframe is IBM 3081. Micros include VME, VAX, Apple II, and Macintosh. Software should include programming expertise in FORTRAN, Pascal, or C. An advanced degree with applications experience in graphics or engineering is preferred.

Scott Cowdry, Computing Center
 University Of Notre Dame
 Notre Dame, Indiana 46556
 (219) 468-5600
 C3WRK @ IRISHMVS.BITNET

POSITION ANNOUNCEMENTS

Data Processing

NEW ENGLAND**BOSTON
SYS-38 SPECIALIST**

BOSTON div. of natl. conglomerate seeks tech. team ldr. for expanding multi-elite devel. effort. Strong user skills & RPG III devel. expertise req. Prof. MIS corp. environ. w/adv. optpy. \$36,000.

**BOSTON
PROGRAMMER
ANALYST — HP3000**

Local div. of Fortune 500 firm seeks polished P/A for new project. Environ. is HP3000 IMAGE COBOL 4GL. Optpy. to participate on h/w, proj. & file H-P network to IBM host. \$32,000.

**BOSTON
VAX PROGRAMMER/
ANALYST**

Major software developer seeks tech. astute P/A for fin. & mfg. apps. devel. Rapid advance optpy. in this fast-paced environ. Previous VAX/VMS, BASIC & DATA-TRIEVE req. Salary to \$30,000.

**HARTFORD
PROGRAMMER/ANALYSTS**

Major fin'l. org. seeks qualified P/A's to work on a number of on-line proj. in a CICS/IMS environ. Min. 2+ yrs. IBM exp. & positions. Co. provides excellent benefits & full reloc. Salary to \$34,000.

**HARTFORD
SYSTEM PROGRAMMER**

Two suburban clients seek exp'd. DOS/VSE, CICS Internals indivs. to provide all tech. corp. support of IBM products. Excellent optpy. to expand knowl. in telecomm's. s/w. also. Salary to \$33,000.

**PROVIDENCE
SYSTEMS ANALYSTS/
PROGRAMMER**

Premiere RI fin'l. institution, expand. IMS, CICS tech. support group for apps. devel. Min. 2+ yrs. DB and on-line design investment sys. a + Co. provides outstanding benefits & rel. Salary to \$36,000.

The Progressive Philosophy:

We believe data processing professionals deserve careers that are challenging, rewarding and rich in opportunity.

As a national leader in specialty insurance and financial services, we offer you the opportunity to become a part of the dramatic expansion of our MIS Division. With a 20-fold increase in budget over the last 5 years, we are becoming the area's fastest growing Data Center.

Our goal is to be the best in the industry by having top management support and financial resources. You will work in a large IBM mainframe environment with a 2000 nationwide terminal network, MVS, JES 2, CICS, IDMS. We need highly motivated people with IDMS knowledge, COBOL background, and IBM mainframe experience for the following positions.

Manager Data Base Administration

Will oversee development of standards and procedures and manage team involved in design, development, implementation of IDMS data base. Requires 8+ years DP background including 3 years supervision, application development and IDMS experience.

Project Manager

Responsible for 2 programming managers and up to 20 programmer analysts. Duties include new applications development, implementation and bringing group into IDMS environment. Requires bachelor's degree, 10+ years' DP experience with 3-5 years' in supervision. Advanced degree, OS/MVS preferred.

PC Manager

Will supervise a staff of 10+ professionals who provide customer service and marketing functions on PC. Requires 8+ years' experience with 3 years' supervisory background in a customer service/marketing environment.

Systems Software Manager

Will manage, plan and support on-line systems software, disk space management and supervise 8 professionals. Heavy vendor/user interface required, along with a strong technical orientation and 3 years' supervisory experience.

Operations Shift Manager

Responsible for management of shift operations, production control and supervision of 10+ professionals. Requires 7+ years' DP experience, OS/JCL production control, with 3+ years' IBM, MVS and shift operations management.

Systems Consultant/Architect

Will participate in the creation of on-line systems architecture for new systems projects. Requires 5+ years' DP experience with 2 years' on-line major system design, and exceptional planning, organization and communication skills.

For prompt consideration, please send your resume indicating position of interest to: The Progressive Corporation, Dept. CK, 6300 Wilson Mills Road, Mayfield Village, OH 44143. An Equal Opportunity Employer, M/F/H.

progressive
THE PROGRESSIVE CORPORATION

PROGRAMMER ANALYSTS

Reno, Nevada

Tired of the commutes, crowds and smog? Consider the dynamic, exciting little city of Reno, Nevada, located at the base of the high Sierras. Reno means water skiing, snow skiing, Lake Tahoe and world famous stars in glittering 24 hour exciting downtown casinos.

Employment with Sierra Pacific Power Company, Northern Nevada's largest D.P. employer, would allow you to maximize professional and personal growth. The successful candidates for these positions will use their professional skills in COBOL and CICS in support of corporate applications in Engineering, Customer Billing Systems using TRES Systems Inc. software and General Accounting using McCormack and Dodge Software and more.

Our environment features an IBM 3081K under operating systems MVS and VM/CMS. Ideal candidates for our current openings will be degreed and have 3-5 years of business programming experience.

In addition to moving expenses and present mortgage assistance, we're offering a top salary and benefit package. Please submit resume to:

STAFFING DIRECTOR**SIERRA PACIFIC POWER COMPANY**

P.O. Box 10100 • Reno, Nevada 89520

An Equal Opportunity Employer M/F/H/V

Software Design Engineer to design, develop and test of real-time call processing software for computer based telecommunications distributed switching system. Prepares and reviews detail mathematical flowcharts and designs documents. Analysis and resolution of problems associated with real-time system functions. Designs and develops testing modules using micro processor assembly level language. Must have BS plus minimum two years experience same job. Hours Mon-Fri 8AM-4:45PM. Salary \$36,209.65/year. Apply to Job Service of Florida, 1045 South Congress Avenue, Delray Beach, Florida 33444. Job Order # FL5314351.

**COMPUTER SYSTEMS
ENGINEER**

- 8:00 a.m. to 5:00 p.m., 40 hours per week, \$25,000 a year. Must have Bachelor of Science degree in Computer Engineering and two years previous work experience in the design, modification and refinement of automated cadastral systems. Inquire with Job Service of Florida, 2312 Gulf-to-Bay Boulevard, Post Office Box C, Clearwater, FL 33518-8002, Attn: Pat Ganno. Job Order No. 5451984

**DATA PROCESSING
CAREER
PROFESSIONALS**

Are you being evaluated based on performance and merit? Are you enjoying a position with high visibility? If not, then come explore the excellent opportunities at the Arthur Fredric Company. Our continued success has expanded our need for qualified data processing professionals. So if you're looking for performance evaluation, high visibility and the rewards of a successful career, come join us! We offer an excellent salary, along with paid medical, hospital and insurance, plus many more outstanding benefits.

- IDMS/ADSO • IMS/DB
- IMS/DC • ADABAS/NATURAL
- CICS (command or macro)
- OS-COBOL • BAL

If you have the experience we need, call or send your resume to:

**ARTHUR
FREDRIC
COMPANY**

5725 N. East River Rd., Suite 375
Chicago, Illinois 60631
(312) 693-3810

An Equal Opportunity Employer M/F

GROUP MANAGER
At National Liberty, Business Automation is More than a Dream

Automation of day to day business operations is a major thrust at National Liberty where implementing today's technology is our key to tomorrow's growth. We have just started three major software development projects which will have a direct impact on our marketing operations. These new projects have resulted in the need for a talented Group Manager to head up our Marketing Systems group. Here's what we seek:

- Minimum of 5 years management experience directing 10-20 programmer/analysts and systems analysts in major projects.
- Solid experience in developing or modifying direct marketing-direct mail oriented marketing systems.
- Strong interpersonal communications skills to interact with senior marketing and corporate management.
- Proven ability in analyzing business problems in terms of how improved information management systems can provide short and long range solutions.

Our compensation and benefit programs are reflective of our standing as one of the leaders in the direct response financial services industry. In addition to this, our multiple IBM CPU data center, set in a 100 acre wooded office campus in suburban Philadelphia, provides the environment where future career growth opportunities will offer long range challenge. If you wish to learn more about the challenge and growth at National Liberty, send resume today to:

Mike D'Elia

NATIONAL LIBERTY
Liberty Park, Frazer, PA 19355

No Phone Calls Please
Direct Applicants Only

Equal Opportunity Employer, M/F/H/V

POSITION ANNOUNCEMENTS


**EDP Salaries Have Risen Dramatically
...Has Yours?**

Money may not be the most important consideration in position evaluation or in career advancement. Yet no one wants to feel unappreciated and underpaid. Certainly you owe it to yourself to check it out. It requires no more effort than a phone call. Our professional consultants can quickly tell you what your salary should be. And, if you wish, they can tell you about a wealth of opportunities that will pay you what you're worth.

Come in. Call. Or mail your resume to the NCA firm nearest to you. Confidentiality is assured. No charge to you for any of our super services.

NORTH: Robert Koenig & Co., Inc.
North Brook, Suite One, 181 Bedford Street
Lexington, Massachusetts 01821 (617) 861-1020

DETROIT: Thos. H. Associates

150 N. Washington, Suite 1000
Chicago, Illinois 60606 (312) 977-1555

CHICAGO: Task Group

1015 North Dearborn Street, Suite 21

Cincinnati, Ohio 45227 (513) 821-8275

CLEVELAND: Innovative Resources

Easton Office Tower, Suite 425

Cleveland, Ohio 44115 (216) 621-4220

CHARLESTON: Michael Thomas

455 W. Washington, Suite 240

Worthington, Ohio 43085 (614) 846-0926

BALTIMORE: DataPro Personnel Consultants

12720 Halifax Drive, Suite 200

Baltimore, MD 21250 (301) 661-8600

MINNEAPOLIS: Abacus Consultants, Inc.

1777 South Harrison, Suite 404

Denton, Texas 76201 (817) 550-5064

MILWAKEE: Electronic Systems Personnel, Inc.

3000 Town Center, Suite 2500

Southfield, Michigan 48075 (313) 553-5580

PHOENIX: Computer Sciences Personnel, Inc.

P.O. Box 8577

Hollywood, Florida 33024 (305) 434-6112

ATLANTA: Computer Services, Inc.

Hartford, Connecticut 06105 (203) 549-4240

INDIANAPOLIS: Career Consultants, Inc.

1200 Westown Parkway, Suite 100

Houston, Texas 77056 (713) 626-4100

KANSAS CITY: D. P. Carter Associates
6405 Metcalf, Suite 502
Shawnee Mission, Kansas 66202 (913) 236-8288

LITTLE ROCK: Superior Resources, Inc.

6016 Fallbrook Avenue, Suite 200

Woodland Hills, California 91367 (818) 884-3000

MEMPHIS: Management Consultants, Inc.

Chancery Park II, Suite 350

350 N. Sunnyslope Road, Phoenix, AZ 85021 (602) 974-8655

MEMPHIS: Electronic Systems Personnel

900 2nd Avenue South, Suite 880

Minneapolis, Minnesota 55402 (612) 338-6714

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK UPDATE:

CA Management Personnel, Inc.

5790 Midwinters Parkway

Dewitt, New York 13214 (315) 446-8492

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

Millburn, New Jersey 07041 (201) 761-4000

NEW YORK: Abacus Consultants, Inc.

7 Day Street, Suite 10

New York, New York 10007 (212) 237-7370

NEW YORK: DataPro Personnel Consultants

P.O. Box 751, 90 Millburn Avenue

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

The most important bank thinks your technical talent is important too!

If you're seeking career opportunities to use your technical knowledge and experience to full advantage, you will find them now with Riggs National Bank of Washington, D.C.

In return for top skills and a commitment to excellence, we offer a state-of-the-art environment, high visibility, and rapid career advancement.

Present and future projects have created the following positions:

Data Security Administrator

3-5 years' data security experience in large IBM environment utilizing ACF II, risk management and contingency planning experience, knowledge of system communications and COBOL, and familiarity with PC and PC security.

Data Dictionary Analyst

2-3 years' experience in data administration utilizing UCC-10 and COBOL programming experience in an IBM shop with knowledge of IMS DB/DC and OS/MVS.

In addition to highly competitive salaries, we offer an excellent benefits package. Located in Washington, D.C., you will enjoy a lifestyle enriched by the capital's many cultural, recreational and historical attractions.

Preference will be given to candidates who contact us directly by submitting a resume to: Technical Recruiter, Employment Department, Riggs National Bank, 1120 Vermont Avenue, N.W., Washington, D.C. 20005. We are an Equal Opportunity Employer M/F.

**The most important bank
in the most important
city in the world.**

RIGGS

The Riggs National Bank of Washington, D.C.

Growth oriented Fortune 500 public corporation has the following positions available immediately at our La Crosse Headquarters:

TECHNICAL SYSTEMS ANALYST

Duties include: Database and network design, performance analysis and maintenance. Experience on large Burroughs operating system is required. Prefer experience with DMSII software and GEMCOSS, COMS, and RDBII products.

SYSTEMS ANALYST

Responsible for system design and new project development in our Information Systems Department. Our large Burroughs mainframe and COBOL programming environment requires 3-plus years of Systems Analysis experience.

Excellent written and oral communication skills and strong leadership, problem-solving, and analysis skills are essential. Experience with Retail Sales and/or Manufacturing systems a plus.

We offer a competitive salary, excellent benefits and a beautiful location within our challenging atmosphere.

Please forward your resume and salary history to:

G. HEILEMAN BREWING COMPANY, INC.
Attn: Corporate Personnel Department
P.O. Box 459
La Crosse, WI 54602-0459

HP/IBM

CALL THE SPECIALISTS!

Choose the recruiters who can be the most effective for you. Diane and Brenda have over 16 years combined experience specializing in Data Processing recruitment and have proven success records. Let their professionalism help you in your search for the right Data Processing career.

DON'T FALTER THIS FALL - CALL THE TWO PRO'S THAT HAVE IT ALL!

Diane Amos, CPC - HP SPECIALIST
Brenda Carey, CPC - IBM SPECIALIST

Amos & Associates

633 Chapel Hill Road
Burlington, NC 27215
(919) 222-0231

Research and Development Project Leader

The Center for Computer Aided Design seeks an experienced Research and Development Project Leader to supervise and carry out research and application of structural system design application. Applicant must have a Ph.D. degree in Mechanical Engineering, with specialization in structural analysis and design. At least 10 years experience in large scale structural analysis and design optimization is required. Salary is in the range \$35,000 to \$42,000 per year. Send resume to: Dr. James E. Johnson, Dept. of Civil and Environmental Engineering, University of Iowa, Iowa City, IA 52244. EO/AE

IMMEDIATE OPENING FOR PRINCIPAL RESEARCH ASSOCIATE

Responsibilities:

Direct technical research, development and distribution of high-tech engineering developments and techniques via the medium of computer software. Review computer software use and needs by AEC, Utilities, Manufacturing and other industries.

Qualifications:

Minimum Education and Work Experience:

MBA from an accredited university. Ten years experience in computer and/or software business with sales, marketing, product development, and management experience. Candidate must have very good oral and written communication skills in English, and the candidate must be willing and able to travel nationally and internationally. The candidate should be familiar with computer aided engineering, design and drafting products.

Send resume, references, current salary and availability information to: Dr. L. Z. Ekin, GTICES Systems Laboratory, School of Civil Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0356.

*Georgia Tech is an Equal Education
And Employment Opportunity Institution*

Applications Programmer - code, test, implement applications software for batch and online large-scale systems. Must have knowledge of Compaq VMEbus, VMEbus/VS100 large-scale mainframe, Wang PC hardware, Wang utilities, Wang procedure language, Wang personal computers as network devices, Wang applications software, local-area communication networking, RPLII (major), Cobol (minor), C, Basic languages, and on-line parser, personal and business applications. BS in computer science or related field or 2-4 years programming experience may be substituted plus minimum one year experience as programmer. Forty hour week, 8 AM - 5 PM, \$16,000 per year. Send resume to JO # FL-5357/000, Job Service of Florida, 3421 Lawton Road, Orlando, Florida 32803.

DATACOMM DB DB2
ADABAS MODEL 204
IDMS ADS/O

CW Systems Inc.
300 West 5th #936 - Austin, Texas 78701
(512) 469-0245 EOE

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

A VERY UNCOMPROMISING POSITION.



COMPAQ IS UNCOMPROMISING ON INDIVIDUAL PERFORMANCE.

We believe that in order to meet a goal of uncompromising performance, we can expect no less than the best from every COMPAQ employee. We've developed a unique culture which encourages open communication and respect for the individual, allowing each member of the COMPAQ team to make a significant contribution to the success of the Company.

Currently, we have positions available in Software Development and Software Audit/Test. Requirements include an in-depth knowledge of operating system internals and excellent leadership abilities. A BSEE or BSCS or equivalent is strongly preferred.

SOFTWARE ENGINEERS and SOFTWARE PROJECT MANAGERS

The positions in Software Development exist for Systems Engineers and Project Managers. Both positions require hands-on development experience with 8088/8086/80286 technology and knowledge of mini/mainframe operating systems. Seven (7) plus years software systems engineering and/or project management experience also necessary. Candidates must possess the ability to supervise projects and people and interface with various outside agencies and contractors. Data communication/networking experience is desirable.

SYSTEMS ENGINEER

Requirements include five (5) plus years experience with software development and software methodologies. Knowledge of software testing and documentation is a plus. Networking experience is strongly preferred. Responsibilities encompass implementation, maintenance and control of local area networks and quality assurance/control of software products' release.

SOFTWARE TESTING SPECIALISTS

Applicants must have systems level knowledge of operating systems and PC's along with seven (7) plus years experience in development or testing of multi-user/multi-tasking operating systems. XENIX®/UNIX® experience is strongly preferred in addition to project management experience.

When we look for people to join our team of highly successful players, we look for professionals who are just as uncompromising as we are. In return for your performance, we offer a challenging opportunity to excel plus top salary and benefits (including stock options). For more information, please write or send your resume to: **COMPAQ COMPUTER CORPORATION**, Dept. RMWC-91, 20555 FM 149, Houston, Texas 77070. An Equal Opportunity Employer.

*UNIX is a trademark of AT&T Bell Laboratories. XENIX® is a registered trademark of Microsoft.

COMPAQ®
COMPUTER CORPORATION

PROGRAMMER ANALYST

The engineering section of our data processing department is at present seeking an Application Analyst. This or more years as an Engineering Programmer is required. Position also requires the following experience:

- PL/I Programming
- IBM VM/CMS
- IBM OS/VS2
- JCL and UTILITIES

Person will work directly with mechanical engineers using computer aided design (CADAM) in designing conveyors and material handling equipment. A mechanical engineer, CADAM experience, and (CADD/CADC) experience is a definite plus. FORTRAN, BASIC, IBM PC (DOS) also desirable. For immediate consideration send resume to:

Jervis C. Webb Company
Webb Drive
Farmington Hills, MI 48018
Attn: Manager of Employment and Placement

Equal Opportunity Employer

C.I.M. PROJECT LEADERS

Impressive F500 mfr. w/aggressive Computer Integrated Mfg. plan seeks several Project Leaders to mgt. diverse aspects of C.I.M. implementation. Req. BA/B.S. degree, knowl. of C.I.M./M.R.P. issues & DEC/VAX exp. Very high potential career opportunity, in rural NY setting. To \$45,000.

ROBERT HARF OF BUFFALO, INC.

420 Main Street
1112 Liberty Building
Buffalo, NY 14202
(716) 642-0801
Personnel Agency

EDUCATION

EXPERIENCE COUNTS! NON-RESIDENTIAL DEGREE PROGRAMS

Professionals in any field may apply for at-distance Bachelor's, Master's or Doctoral degrees. No need to leave home, documenting work experience instead of further classroom, and presenting a career accomplishment project instead of a standard thesis. The cost is moderate, the time for completion is shortened. Developed for working professionals. Program authorized by the Department of Education. Students Worldwide.

**CALIFORNIA UNIVERSITY
FOR ADVANCED STUDIES**
School of Professional Management
Office of the Dean, Room C-2
100 Galli Drive
Novato, CA 94947 (415) 382-1600

CONSULTANTS/CONTRACTORS

CW Systems, Inc. is a small and growing professional consulting firm with opportunities in Austin, Houston, Dallas and other southwest cities. If you are interested in a fast track career in consulting as an employee or contractor and have two or more years in one of the following, send us your resume today.

DATACOMM DB DB2
ADABAS MODEL 204
IDMS ADS/O

CW Systems Inc.
300 West 5th #936 - Austin, Texas 78701
(512) 469-0245 EOE

NY METROPOLITAN AREA & NEW ENGLAND BANKING IBM

- Data Communications, V.P. level. Knowl network design & implementation. Also X.25 pkng switching. 5 yrs exp
- MVS IMS Syst Prog'. CICS a plus. 3-5 yrs exp
- COBOL ALGOL DMSI Prog' Analyst. 2-5 yrs exp

BURROUGHS

- DEC VAX. Banking environment Applications Prog's w/VAX BASIC. 3-5 yrs exp
- Applications Prog's w/known COBOL. 3-5 yrs exp

BROKERAGE

- ANALYST with extensive brokerage background.

Call 212-398-9891

or submit resume to:

HANK WILSON ASSOCIATES
16 W. 40 St., NY, NY 10016

PUBLICATIONS

Boxes and Arrows

The monthly newsletter of IDMS users. Over 30 pages, each month, all current events, conferences and presentations, and feature articles aimed at DBAs and developers, too. Includes news from the IDMS User's Association. Software solutions in IDMS, AD/SIO, CULPRIT. A monthly technical puzzle to keep you thinking. Keep in touch with what the rest of the world is doing. IDMS, \$60/year in the US, \$70 Canada or Mexico, \$80 anywhere else. Sample copy free.

Boxes and Arrows Publishing
P.O. Box 792
Jacksonville, FL 32201-0792
(904) 642-5388

Computerworld Sales Offices

Publisher/Vice-President, Donald E. Fagan

VP/Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Ronald Mastro
District Managers/Michael F. Kelleher, David Peterson,
Bill Cadigan
Associate Manager/Sherri Driscoll
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

CHICAGO SALES OFFICE (312) 827-4433
Midwest Regional Manager/Russ Gerches
District Manager/Kevin McPherson, Larry Craven
Sales Assistant/Kathy Sullivan
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Manager/Fred Lo Sante, Frank Genovese
Sales Assistant/Alvin Burke, Sue Larson
COMPUTERWORLD, Paramus Plaza, Suite 1000,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
District Managers/Bernie Hockswender, Carolyn Knox
Western Regional Director/William J. Healey
COMPUTERWORLD, 18004 Sky Park Circle, Suite 255,
Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milone
District Managers/Ernest Chamberlain, Mark V. Glasner,
Acquisitions Manager
Account Manager, Classified/Nicole Boothman
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Director/Michael J. Masters
Sales Assistant/Melissa Christie
COMPUTERWORLD, 1400 Lake Drive, Suite 330,
Atlanta, GA 30319

DALLAS SALES OFFICE (214) 991-8366
District Manager/Mark V. Glasner
Western Regional Director/William J. Healey
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

CLASSIFIED ADVERTISING (214) 991-0700
National Recruitment Sales Manager/AI DeMille
Recruitment Account Executives/Geoff Dodge,
Derek E. Hultzke

COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

CW INTERNSHIP & MARKETING SERVICES
Managing Director/Craig Cuttitta
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

(617) 879-0700

COMPUTERWORLD, 1060 Marsh Road
Menlo Park, CA 94025
(415) 328-8064

Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Tøyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 (CW NOR N).

People's Republic of China: Chen Mingjun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 501, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wien, Austria. Telex: 115 542 (sch/a).

Brazil: Eric Hippieau, Computerworld Brazil, Rua Pedroso de Morais 1053, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 113 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles de Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniela Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano, Phone: (2) 688 9773. Telex: 333436 (GEIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 9-2 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217 (Computerworld Japan only).

Stevens Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kanda Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117. Telex: J26860 (reps for all CCWI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK The Hague.

Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Tøyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 (CW NOR N).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 Izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW CN).

Sweden: CW Communications AB, Soda Hamnvagen 22, 115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NOVACOM).

Switzerland: Gebhard Ostwald, CW Publikationen AG, Witikonerstrasse no. 15, CH-8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CCWI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1B 8UT, United Kingdom. Phone: (01) 831-9252. Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CCWI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Uptadel, CW Publikationen GMBH, Friedrichstrasse 31, 8000 München 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

CW Communications/Inc.

Board Chairman
Patrick J. McGovern

President
Walter Boyd

Executive Vice-President
Lee Vidmer

Publisher/Vice-President, Donald E. Fagan
VP-Sales, Edward P. Marecki, Group VP-Circulation, Margaret Phelan, VP-Finance, William P. Murphy, Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171.

SALES Vice President, Edward P. Marecki, Manager/Marketing & Sales Operations, Kathy Doyle, National Recruitment Sales Manager, AI DeMille, Display Advertising Manager, Carolyn Novack, Display Advertising, Maureen Carter, George W. Griffin, Mary Campano, Classified Operations Manager, Cynthia Delany.

COMMUNICATION SERVICES Senior Vice-President, Jack Edmonston, Director Research, Kathryn Dinneen, Sales Promotion Director, Liz Johnson.

PRODUCTION Production Director, Peter Holm, Senior Production Manager, Leigh Swearingen, Pestle-Monahan, Patricia Gaudelet, Typesetting Manager, Carol Polack, Art Director, Tom Monahan.

CIRCULATION Group Vice-President, Margaret Phelan, Circulation Director, Nancy L. Merritt, Corporate Fulfillment Director, Maureen Burke.

CONFERENCE MGT. GROUP President, William R. Leitch.
MS Corporate Director MIS, Jeff Condeiro.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106.
Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

Advertisers Index

Armdahl Corporation	53	Invitational Computer Conference	88
Anderson Jacobson	8	Isomorphic Systems, Inc.	78
Applied Management Inc.	91	KMW Systems Corp	49
ASK Computer	60	LaserMaker	13
AT&T	42,57,94-95	McCormack & Dodge	116
Bendata	53	Michaels, Ross & Cole	95
Britton-Lee	88,89	Motorola Computer Systems	39-41
Brookvale Associates	69	NCR-ADDS	79
Camdex	13	NEC-Electronics	84-85
Chiccom	51	Northern Telecom	32-33
Cincom Systems	74-75	Novell Inc.	82
Cognos	10,12,14	On Line Software International	66,67
Communication Networks	87	Oracle Corp.	9,19
Computer Corp of America	45,70-71	Quimax	24
Compuware	38	Realia Inc.	46
CW Australia	89	Relational Database Systems	20-21
CW Circulation	86	Relational Technology Inc.	34
CW Executive Report/Product Spotlight	93	Royal Hong Kong Jockey Club	72
CW Italy	83	SAS Institute, Inc.	23,26-27
CW Japan	77	Software Technologies & Research (STAR, Inc.)	14,15
CW Recruitment Testimonial	56	South West Software	78
CW ROP Testimonial	81,110	Stratus Computer	50
CW United Kingdom	97	Syncsort	5
Data Design Associates	22	Tandem	96
Data Language Corp.	115	Teknowledge	11
Datasouth Computer	52	Telex	18
Dataware	90	Texas Instruments	30-31
Digital News	92	The Systems Center	83
Duquesne Systems	76	Tower Systems	29
Epson America	64-65	TRW	54
Formscan	61	Unix Expo	37
Genicom	80	Verifone	51
Group Operations	25	VM Software	3
Hewlett-Packard	28	Xerox	36
Honeywell Information Systems	58-59		
IBM	68,90-91		
Innovation Data Processing	7		
Interface Group	48,62		

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

NEWS

Site license: Micro managers respond

From page 1

respondents considered price to be very important, and 25% considered price to be somewhat important. From firms with sales-per-site of more than \$100 million, 90% believed vendors should provide site licensing, and 83% of the respondents cited price as very important.

Site licensing is on the upswing. A recent Forrester Research, Inc. poll of 42 Fortune 1,000 companies concludes that 22% were site-licensing (providing a license for a site) at least one package, and 17% were company-licensing (providing a license that covers an entire corporation) at least one package. Forrester expects both types of licensing to increase 50% in the next year.

Buckholtz is not alone in pushing for site licenses. "A lot of firms believe that if they don't give us a site license, we will buy the product anyway. That is just not true," says Walter Kennamer, senior manager in the national computer audit group of Big Eight accounting firm Ernst & Whinney in Cleveland. "Before I would standardize on anything, I would have to have an unlimited site license. Nobody out there is that good that they don't have competition that is good enough."

Like Buckholtz, Kennamer does not feel that avoiding the major vendors means settling for second best. "I have no trouble at all defending the proposition that [Computer Associates'] Supercalc is a better product than Lotus 1-2-3. But even if Lotus had been better than Supercalc, we wouldn't have standardized on Lotus, because they weren't willing to do business with us on terms we could accept."

The advantages of site licensing to users go far beyond price and include product standardization, wider distribution of technology, limited liability for unauthorized copying, better support and a closer relationship with the software vendor.

"The marginal cost of an additional software package under a site license is almost zero. It costs nothing for a new user to learn the product. The site license goes a long way in encouraging people to use microcomputers. As a result, we are going to have a lot more copies than we would have if we bought them on an individual basis," Kennamer says.

Users' fears of messy lawsuits over piracy are assayed by site-license agreements. "We were very concerned with making sure that the copyright on software we buy is protected. We are ethical, and we don't want to get sued," Kennamer says.

Site licenses also help firms distribute more technology to end users. "In our company, hardware and software are budgeted separately. Had we not had the licensing, we would not have spent any more money on software, and we would have run out of reasons to buy hardware," Buckholtz says.

Biggest deal yet

In the most publicized site-license announcement to date, General Electric Co. reached unlimited licensing agreements with Office Solutions, Inc. and Computer Associates. "Our preferred method of doing business is to go with the unlimited license," notes Pat Stadel, manager of application software acquisition for GE Corporate Information Technology in Bridgeport, Conn.

According to GE, the programs are a success. "Before the announcement was even issued, there were over 1,000 orders for Supercalc," says Fred Dulany, a GE representative. GE has already shipped 5,000 of the

various packages covered by site licenses, and most of those orders are for Office Writer, Dulany says. He says there are 25,000 personal computers within GE.

Lotus has taken pains to point out that GE remains an excellent customer, and observers have wondered if Supercalc will become the GE corporate standard.

"We never intended to displace Lotus. We intended Supercalc to co-exist with Lotus," Stadel says.

Although the absence of site licensing or aggressive volume purchase programs from the top three microcomputer software vendors has given smaller vendors a chance to make inroads into the corporate market, it takes more than low prices to make some corporations adopt packages from smaller vendors.

"The products we most want site licenses for are from the bigger vendors," says Ronald Jenks, director of information services for Touche Ross & Co. "We are not really interested in switching just because someone offers a site license with a lower price," says Ray Baron, manager of advanced office systems for Michigan Consolidated Gas Co.

But some believe that smaller vendors are pricing products too aggressively and sacrificing profits in a desperate attempt to gain market share.

"Chances are, the smaller companies are at best breaking even in their site-license programs. Some companies are offering site licenses out of desperation," claims Robert M. Lefkowitz, vice-president of software research for Infocorp.

"I think there are some smaller vendors who might be using this as a last stab at a presence," agrees Jan Eddy, president of Office Solutions, which does offer site licensing.

But Buckholtz does not buy the desperation theory and reports that none of the vendors with which he

has a license have gone out of business. Citing company policy of not discussing specific vendors, Buckholtz declined to say what products are licensed.

Smaller firms argue that aggressive pricing not only gets a firm's foot in the corporate door, but provides profitability.

"When Ed Esber [chairman of Ashton-Tate] says site licensing is economic suicide, he is right. It is for them. For us, though, it makes a lot of sense because we will get revenue we wouldn't otherwise get," says Eliot Sokolow, director of sales for Cosmos, Inc.

In addition to profits, the benefits of site-license programs for smaller vendors include increased visibility; the possibility of becoming a standard within a large corporation; additional revenue from upgrades, new products and support; and keeping competitors out of these accounts.

"It is strictly an economic decision for software vendors. Site licenses make sense if they end up pulling more money out of the market than selling on a per-copy basis," says Jeffrey Tarter, publisher of "SoftLetter," an industry newsletter published in Cambridge, Mass.

"When you look at the fact that we are taking sales away from another product, it is perhaps sales that we would not have made at all without the site licensing," Office Solutions' Eddy says.

The question remains, Will the top three firms ever bow to the pressure for site licensing? Tarter doubts that any of the top three microcomputer software firms will offer site licensing in the near future. "Lotus and Ashton-Tate are so close to saturating the markets for their products that they really have something to lose by site-licensing."

For GE's Stadel, it is still an open question. "We have ongoing negotiations with each of them," she says.

Leading options: Site licensing, discounts, support

Site licensing, volume discounts or support programs available from selected microcomputer software vendors.

Lotus Development Corp.

Major products:
1-2-3, Symphony

Copy protection and liability:

Copy protection removed for firms with 100 or more copies of the latest releases of 1-2-3 or Symphony. Limited liability (liable for the retail price of illegally copied software) is available for firms with enforced antipiracy programs. Contract signed by company officer required.

Pricing and volume requirements:
For direct sales, 500 copies of 1-2-3 or Symphony are required, and price is determined through special bids. Prices from Lotus will not be lower than those available from high-volume dealers.

Upgrades:
Upgrades are distributed direct. Volumes 1 to 100, \$150 per copy; 100 to 999, \$125 per copy; and more than 1,000, \$100 per copy.

Microsoft Corp.

Major products:
Multiplan, Microsoft Word

Copy protection and liability:

User is liable only for the full retail price of

illegally copied software. Most products are no longer copy protected.

Pricing and volume requirements:
A minimum of \$100,000 is needed to qualify for a 45% discount.

Upgrades:

Upgrades are distributed either via a master disk or by Microsoft. Participating firms receive upgrades for half price.

Ashton-Tate

Major products:
Dbase III, Framework

Copy protection and liability:

Copy protection is no longer available, and there is no limited liability for illegal copying.

Pricing and volume requirements:
No direct sales or discounts are available from Ashton-Tate. Purchase price is still negotiated between the corporation and a computer dealer.

Upgrades:
All upgrades can be covered by an annual fee, or upgrades can be made on a case-by-case basis.

Computer Associates International, Inc.'s Micro Products Division

Major product:
Supercalc 4

Copy protection and liability:

No copy protection, no limited liability. An unlimited site license starts at \$82,000.

Upgrades:

Available free to firms with maintenance agreements.

Wordperfect Corp.

Major product:
Wordperfect

Copy protection and liability:
No copy protection, limited liability available.

Pricing and volume requirements:
Site licenses for Word Perfect range from \$45,000 for 500 copies from a master disk to \$300,000 for 10,000 copies.

Upgrades:

Upgrades are provided automatically for a 10% annual fee.

Lifetree Software, Inc.

Major Product:
Volkswriter word processing software

Copy protection and liability:
No copy protection, limited liability available.

Pricing and volume requirements:
Firms must order at least 50 units and receive more than a 50% discount off retail price. Discounts increase with volume. User can obtain master disk to

make copies or opt for individual packages.

Upgrades:
Same price for any user.

Cosmos, Inc.

Major product:
Revelation data base

Copy protection and liability:
Revelation is not copy protected, limited liability available.

Pricing and volume requirements:
The cost is \$50,000 for an unlimited license for the single-user version, \$75,000 for the network version.

Upgrades:

\$5,000 unlimited upgrading for both versions.

Software Publishing Corp.

Major Products:
PFS series, PFS:Professional series, Harvard series

Copy protection and liability:
No copy protection, limited liability available.

Pricing and volume requirements:
Site license available for \$75,000 for a single PFS product and \$100,000 for a single Harvard product.

Upgrades:

Upgrade of 10 or more available for a 40% discount.

COMPUTER INDUSTRY

INDUSTRY NOTES

Concord Data divides into two firms

Concord Data Systems, Inc. last week divided its local-area network (LAN) and data communications divisions into two separate companies.

The LAN company was renamed Concord Communications, Inc., while the modem business retained the current name.

Both companies will continue to be headquartered in Marlboro, Mass.

The split will allow better allocation of resources and a more straightforward description of Concord's business to the financial community, according to Concord Communications Marketing Vice-President Mike Zak.

The DMW Group, Inc. announced that it will merge with New York-based **Commercial Software, Inc.** to form DMW Commercial Systems, Inc.

The Ann Arbor, Mich.-based DMW, best known as a telecommunications consulting firm, also operates a DMW Software unit that will mesh with Commercial Software's network management software development. DMW Chairman Dixon Doll will be chairman of the new company, also located in Ann Arbor.

Burroughs Corp.'s Memorex Media Products Group changed its name to **Memorex Computer Supplies Group** to reflect the company's diversification away from magnetic storage media. Edward

Blechschmidt, former president of Burroughs' Business Forms Division, will head the unit.

Novell, Inc. announced that sales and profits more than doubled during the third quarter ended July 26. The Orem, Utah, local-area network vendor reported net income of \$2.6 million, or 23 cents per share, on revenue of \$22.7 million. Sales advanced 41% from second-quarter levels.

Televideo Systems, Inc. reported a loss of \$689,000, or 2 cents per share, for the third quarter ended Aug. 1. Revenue of \$25 million represented a 20% gain from the previous quarter but was roughly flat compared with year-earlier sales of \$24.9 million.

The Sunnyvale, Calif., terminal and microcomputer vendor lost \$10.8 million, or 26 cents per share, in the third quarter of 1985.

It took the Northern California Council of the American Electronics Association (AEA) to pair up **Silicon Valley executives Paul Ely and William Krause again.**

Ely and Krause are the chief executive officers for aborted merger partners Convergent Technologies, Inc. and 3Com Corp., respectively.

Although Convergent has had its share of problems since the merger fell through in March, Ely will serve as next year's chairman of the AEA council, and Krause will be its vice-chairman.

Sperry group goes on block

From page 114

ing Sperry after Burroughs began its hostile takeover last May. Honeywell, according to the documents, offered \$700 million in cash for the Aerospace & Marine Group.

"If you look at Honeywell's business, particularly revenues outside of the computer industry, you see a well-positioned military group. The Sperry unit would complement it," said Charles Varga of the Cerberus Group, a Frenchtown, N.J., market research firm specializing in mergers and takeovers. "I wouldn't rule them out."

A Honeywell spokeswoman said the firm does not comment on speculation.

Analysts contended that the Aerospace & Marine Group was Sperry's most sellable asset.

Other offers to acquire the group are expected to come from a cadre of Department of Defense contractors, including Boeing Co., Ford Motor Co., Litton Industries, Inc., Lockheed Corp. and General Motors Corp., which is still said to have cash to spare after its 1985 purchase of Hughes Aircraft Co.

Although a Burroughs spokesman characterized interest in Sperry's Aerospace & Marine group as "intense," some analysts, citing possible

federal cutbacks in defense spending, say Burroughs may not have an easy time divesting the group.

"It's a very good operation, but with the defense budget changing, people may have cooled to the prospect of a defense-related acquisition," noted Michael Geran of E. F. Hutton & Co. "It's a difficult, but doable deal."

The Aerospace & Marine Group, which employs 9,500, projects revenue of \$750 million for the fiscal year ending March 31, 1987, compared with \$700 million in fiscal 1986, the Burroughs spokesman said. Sperry does not break out the group's profitability, but the unit is in the black, the spokesman added.

The Sperry division was the second defense-related unit of a high-tech company to be placed on the block last week. Gould, Inc. disclosed plans to sell its defense systems business, which recorded \$400 million in sales in 1985. The avionics and military communications unit employs 5,000 people.

Burroughs will not entertain official bids until it chooses an investment banker, the spokesman said.

The company, which expects to conclude its acquisition of Sperry at a special shareholders meeting Sept. 16, said the final decision on whether to sell the group will depend on buyer interest and the price offered.

Burroughs expects to divest Sperry's Aerospace & Marine unit by the year's end, a company spokesman said.

HP stock performance rests on Spectrum market results



ACTIVE ISSUES

Kathy Porteus

pared with Digital Equipment Corp.'s situation. By adopting strict cost-cutting measures, DEC was able to highly leverage its new products; consequently, it continues defying market conditions.

But Peter E. Heymann, analyst with Drexel Burnham Lambert, says, "You cannot necessarily make the same case with what Spectrum will do for HP. At this point, I'm only fearful that people's expectations about how quickly these products get out in the world could be ahead of reality." Heymann estimates the company will earn \$2.40 to \$2.60 per share in fiscal 1987.

Owing to the pent-up demand of HP 3000 users, all Spectrum products produced in 1987 will be shipped, according to analysts.

The next DEC?

Rogers of Mabon, Nugent speculates, "HP could be the next DEC if the earnings from computer shipments come through and if HP gets some help from the economy." He adds, "I'm not as convinced that the economic outlook is as dire as our perceptions now indicate." As a result, Rogers estimates the company will earn \$2.65 per share in 1987.

Analysts agree that HP's computer-aided engineering business is strategically critical but that its current offerings are playing catch-up to the CAE products of companies such as Mentor Graphics, Inc. and Daisy Systems Corp.

Merrill's Casey says HP's strength in CAE is its ability to provide integrated solutions, although the day when this would be a key selling point has not yet arrived.

Despite differing expectations about Spectrum and the economy, which also mean differing opinions as to what value should be accorded HP's stock, analysts tend to agree that the company qualifies as a core technology holding.

"Given its quality, its increased competitiveness in computer markets and its ongoing dominant position in the instrument business," Rogers says, "HP is one of those stocks you can buy for two to three years out."

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

Corvus drops auditor, causing dispute

By Maura McEnaney

SAN JOSE, Calif. - Corvus Systems, Inc., the computer networking company that recently introduced the first Intel Corp. 80386-based micro, is embroiled in a dispute with its former auditing firm over Corvus's decision to drop its services.

Corvus recently replaced Big Eight accounting firm Coopers & Lybrand with Deloitte Haskins & Sells. Coopers & Lybrand, in a letter to the Securities and Exchange Commission (SEC), claimed that Corvus executives threatened to fire the accounting firm if it released a negative opinion on the firm's financial status.

Coopers reportedly planned to issue a "going concern" qualified opinion on Corvus, a rating which indicates the auditor had some doubts about Corvus's survival. For the fiscal year ended May 31, Corvus reported a loss of \$32.8 million.

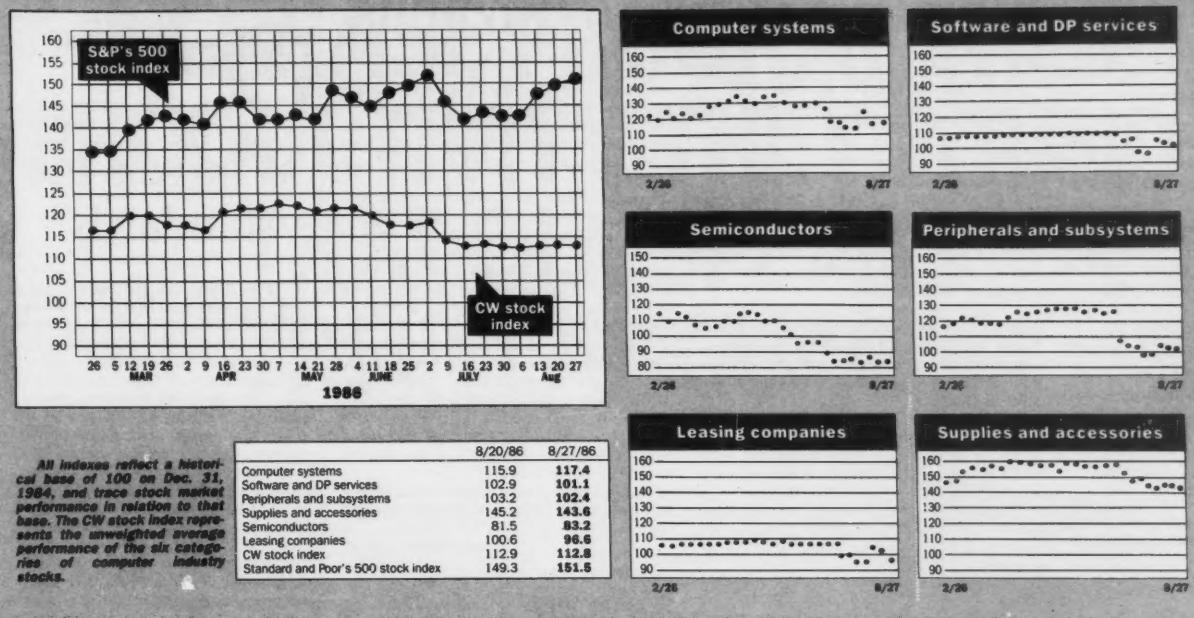
Corvus Executive Vice-President Joseph Rooney told *Computerworld* that the firm's decision to fire Coopers & Lybrand was based only on "quality and timeliness of service."

According to Rooney, Corvus has told Coopers & Lybrand that its letter to the SEC was inappropriate and was "potentially damaging to Corvus and its reputation."

COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index



All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, AUGUST 27, 1986

EXCH	52-WEEK RANGE (I)	PRICE CLOSE AUGUST 27, 1986	WEEK NET CHG	WEEK PCT CHG	EXCH	52-WEEK RANGE (I)	PRICE CLOSE AUGUST 27, 1986	WEEK NET CHG	WEEK PCT CHG	EXCH	52-WEEK RANGE (I)	PRICE CLOSE AUGUST 27, 1986	WEEK NET CHG	WEEK PCT CHG	
COMPUTER SYSTEMS															
O ALPHAMICROSYSTEMS	8 4	4.38	+0.0	+0.0	O ALTCOMPUTERSYS	10 10	10.13	+0.0	+0.0	O AMINTLINC	9 3	6.00	-0.1	-2.0	
O ALTOPSCOMPUTERSYS	19 10	12.50	-0.3	-2.0	O AMERCOMPUTERSYS	25 14	19.25	-0.3	-1.3	O ANDERSONJACOBSONINC	3 2	2.13	-0.1	-5.6	
O AMDAHL	20 10	20.13	+2.7	+12.6	O ANAGROUPS	20 11	11.30	+0.0	+0.0	O ASTRESHINC	33 11	12.63	-0.6	-4.7	
O APPALCHIAN COMPUTER INC	9 9	12.00	+0.5	+4.6	O ANACOMPANY	18 9	12.63	-0.9	-6.5	O ASTRODATA	10 6	7.50	+0.5	+7.1	
O APPLE COMPUTER INC	39 15	37.00	+0.8	+2.1	O ANALYSTSINTLCORP	10 4	4.00	-0.1	-3.0	O AVANTAGE COMPUTING	9 3	6.75	-0.3	-3.6	
O AT&T	26 20	23.80	+0.3	+1.1	O ANALYSTSINTLCORP	10 4	4.50	+0.0	+0.0	O BANCTECINC	13 7	6.75	+0.0	+6.7	
O BURGESSHGS CORP	76 52	74.50	+3.4	+4.7	O ANALYSTSINTLCORP	10 4	4.50	+0.0	+0.0	O BARTBERANEK&NEWMAN	48 29	41.75	+0.0	+0.0	
O C128 CORP	7 4	4.70	+0.5	+10.8	O ANALYSTSINTLCORP	10 4	4.50	+0.0	+0.0	O BARTBERANEK&NEWMAN	8 4	6.50	+0.0	+0.0	
O COMPAC COMPUTER CORP	18 8	14.75	+0.3	+1.7	O ANALYSTSINTLCORP	10 4	4.50	+0.0	+0.0	O BCTEC CORP	9 6	6.50	+0.1	+2.0	
O COMPUTER CONSOLES INC	12 6	8.75	+0.5	+6.1	O ANALYSTSINTLCORP	10 4	4.50	+0.0	+0.0	O BCTEC CORP	9 6	6.50	+0.0	+0.0	
O CONCURRENT COMP DRL	25 1	1.80	+0.1	+5.6	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O DATAPOINT CORP	27 15	25.00	+0.5	+2.0	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O CONVERGENT TECH	14 4	4.13	+0.5	+12.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O CRAY RESH INC	100 44	82.75	+0.8	+0.9	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O DAISY SYS CORP	32 8	9.88	-0.3	-2.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O DIGITAL EQUIP CORP	50 30	38.00	+0.3	+0.8	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O DIGITAL EQUIP CORP	103 51	101.50	+2.4	+2.4	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O ELECTRONIC ASSOC INC	7 4	4.13	-0.1	-2.9	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O FEDERAL POINT SYS INC	56 14	14.00	+0.5	+3.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O GOULD INC.	38 15	21.38	+3.0	+16.3	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O HARRIS CORP DEL	36 22	31.00	+0.8	+2.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O HEWLETT PACKARD CO	48 29	44.50	+1.5	+3.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O HONEYWELL INC	87 59	52.00	+2.5	+4.8	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O IBM CORP	121 122	141.13	+1.9	+1.3	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O IPI SYS INC	4 1	2.75	+0.0	+0.0	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O ITT CORP	60 32	54.63	+1.1	+2.1	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O M A M I N C	13 13	15.00	+0.5	+3.8	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O MITSUBISHI ELEC INDL LTD	103 49	103.00	+1.3	+14.8	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O MENTOR GRAPHICS CORP	21 11	14.63	+0.1	+0.9	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O MOHAWK DATA SCI CORP	4 1	2.88	+0.3	+9.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O NCR CORP	19 11	10.13	+0.3	+0.0	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O PRIME COMPUTER INC	28 15	22.50	+1.6	+7.8	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O SPERRY CORP	77 46	76.00	+0.4	+0.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O STOWE COMPUTER	26 15	22.00	+0.3	+1.1	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O SYMBOLICS INC	16 6	6.00	+0.0	+0.0	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O TANDEM COMPUTERS INC	39 13	39.25	+1.4	+3.6	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O TANDY CORP	45 32	36.50	+1.3	+3.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O TENEX CORP	148 88	119.38	+1.0	+1.0	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O ULTIMATE CORP	23 12	14.63	+0.8	+5.4	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O WANG LABS INC - B	23 12	14.63	+0.8	+5.4	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O WANG LABS INC - C	23 11	14.50	+0.8	+5.5	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
O XEROX CORP	72 46	58.00	+0.8	+1.3	O AUTOMATICSYS	39 16	37.63	+4.1	+12.3	O CENTRALGRAPHIC CORP	29 16	15.50	-0.8	-4.6	
SUPPLIES & ACCESSORIES															
N AMER BUSINESS PRODS	37 25	28.13	-0.8	-2.6	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N BARRY WRIGHT CORP	25 17	18.50	-0.1	-0.7	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N DUPLEX PRODS INC	23 17	20.00	-1.5	-7.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N ENNIS BUSINESS FORMS INC	28 15	25.00	+0.3	+1.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N 3M CO	115 74	112.88	+1.4	+1.2	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N AMERICAN LOGISTICS LTD	25 18	22.00	-0.3	-1.1	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N STANDARD REGISTER CO	50 31	37.50	+0.0	+0.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	
N WALLACE COMPUTER SVCS	50 33	46.63	+0.0	+0.0	N AUTOMATICSYS	34 14	19.63	+3.0	+18.0	N AUTOMATICSYS	34 14				

COMPUTER INDUSTRY

INSIDE

Electronic publishing vendor Texet typifies the market's new approach to selling user benefits, not technology/**89**

Wang exec John Thibault will take over the helm at Intecom/**91**

Bell Atlantic names new software boss, prompting speculation on an acquisition/**94**

Concord Data Systems divides its LAN and modern businesses into independent companies/**112**

INSTANT ANALYSIS

"It's a computer company masquerading as a bank."

— Michael Geran, E. F. Hutton & Co., on Digital Equipment Corp.'s balance sheet, which includes \$1.9 billion in cash

Tandon splits into two units

Ailing firm to focus on PC-compatible market

By Maura McEnaney

CHATSWORTH, Calif. — In an attempt to increase its efforts in the personal computer market while decreasing emphasis on its ailing disk drive business, Tandon Corp. last week reorganized into two independent business units.

Under the plan, one division will be responsible for developing, manufacturing and marketing IBM-compatible personal computers, while the other will be responsible for selling Tandon disk drives in new retail channels.

The company also announced 50 layoffs within its corporate and administrative areas, its second work force reduction within a month, and 10% across-the-board payroll reductions.

More than 225 employees were laid off and 270 furloughed when Tandon announced it was closing manufacturing op-

erations at its Microtek Storage subsidiary in San Jose, Calif., and moving manufacturing to Singapore [CW, Aug. 11]. Tandon's work force now stands at about 1,000, compared with 2,450 in March 1984.

Analysts said the two moves could provide a much-needed boost for Tandon, which is hoping to compete for a portion of the lower priced compatible market after losing \$17.5 million in the first three quarters this year. Tandon lost \$50.2 million on \$214 million in sales during the same period in 1985.

"If you look at the market in general terms, there's always room for a lower priced brand name," analyst James Stone of Shearson Lehman Brothers, Inc. said. "You only have one low-price competitor with any recognition, and that's Leading Edge Computer Products, Inc. Maybe there's room for another."

According to Stone, Tandon has a safety net of existing OEM disk drive customers from which to build its PC business. "By

See TANDON page 95

Sperry group goes on block

By Alan Alper

DETROIT — Burroughs Corp., moving to defray the \$2.9 billion it must raise to fund its \$4.8 billion acquisition of Sperry Corp., last week formally disclosed its intent to divest Sperry's Aerospace & Marine Group. Analysts are keeping a watchful eye on Honeywell, Inc. as a potential buyer.

Burroughs said the decision to divest the business unit, which manufactures primarily flight control systems and marine-related instruments for military and commercial customers, would leave the combined corporation with what it considers its two core businesses — commercial information systems and defense systems.

Honeywell, according to documents filed with the Securities and Exchange Commission, expressed interest in acquiring

See SPERRY page 112



INDUSTRY INSIGHT

Clinton Wilder

Who sets the standards?

For five years, the phrase "industry standard IBM Personal Computer" has been the watchword of the entire microcomputer industry. But five years is an awfully long time in that industry. With micros poised to enter the Intel Corp. 80386 era, the evolution of the market has placed "industry standards" in an entirely different light.

The Big Blue Miracle of Boca Raton, Fla., clearly established the business microcomputer standard of the early 1980s. That standard was labeled de facto, meaning nowhere was it written that users, software developers and peripherals vendors had to live their computer lives around DOS. The market simply saw to it — with a large push from IBM, the greatest marketing group the industry has ever seen.

Just as the Armonk, N.Y., brain trust had given the late Phil Estridge's Entry Systems Division enough slack to configure an IBM product with outside vendors' components, the product itself gave the market enough room to grow up around the industry standard of IBM compatibility. But the salient point, which IBM may have overlooked, is that IBM alone did not set that standard; market direction did.

Now roll the tape forward to this month, with one 80386-based micro already launched by Corvus Systems, Inc. and the expected blockbuster from Compaq Computer Corp. due next week.

"Our research shows that the risk of having an 80386 machine before IBM is

See WHO page 92

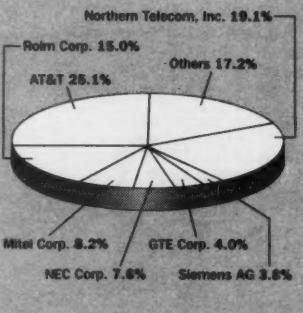
Wilder is Computerworld's senior editor, computer industry.

DATA VIEW

JEFF BABINEAU

PBX market share

U.S. private branch exchange shipments by vendor in 1985



Information provided by Northern Business Information, Inc.'s annual PBX market survey.

Retailer tries to breathe new life into Columbia Data Products

Plans to form users group, revive AT clone

By Ninamary Buba Maginnis

FOREST CITY, Fla. — The orphaned users of Columbia Data Products, Inc. IBM-compatible personal computers may have found a new father — or godfather, that is.

Godfather's Used Computer Syndicate, a \$2 million-a-year mail order and retail computer store, has purchased the assets of the defunct Columbia, Md.-based personal computer manufacturer for an undisclosed amount and plans to form the Columbia Owners Group (COG) for an estimated 70,000 users.

As any godfather would, Godfa-

ther's president and chief executive officer, Alan Welsh, says he is set on protecting Columbia users.

Columbia, one of the first manufacturers of IBM-compatible personal computers, filed for bankruptcy protection from its creditors in May 1985 and closed shop last November after an unsuccessful search for a buyer.

The attempted resurrection of Columbia should be good news to Columbia customers, whose ranks include users in the military, the Internal Revenue Service, the Environmental Protection Agency and Honeywell, Inc.

"I'm all for it," says Commander Roger New, U.S. Navy weapons officer at the Naval Air Station in Fallon, Nev. "I'll be able to talk to other Co-

lumbia users to find out how they use their machines. It would be wonderful to talk to somebody else instead of feeling that I bought a loser — and I know I didn't. I recommended the machine before the company went out."

Aside from forming COG, Godfather's plans to market 900 leftover Columbia IBM Personal Computer-compatible machines and manufacture the firm's previously designed but undelivered IBM PC AT-compatible, according to Welsh. He adds that the retailer will immediately offer software upgrades of read-only memory BIOS and DOS to Columbia micro users.

The Columbia purchase encompassed the bankrupt firm's name, technology and "four or five truck-

loads" of documentation, engineering reports and unsold machines, according to Welsh.

But not all users are confident that Godfather's will be able to fully support the product line. David Siegal, a software engineer for Philadelphia-based Computer Command and Control Co., says, "I'm trying to get a machine upgrade without complete success. Godfather's wanted to charge me for a copy of DOS I don't actually need. It could just be a lack of familiarity with all the details of Columbia systems. Most units aren't as archaic as mine."

Godfather's plans to upgrade the 900 unsold Columbia micros with either 10M-byte or 20M-byte hard drives, install software and sell the See RETAILER page 97

WHEN NCR WANTED TO INCREASE PROGRAMMER PRODUCTIVITY, THEY FOUND THAT DLC SPEAKS THEIR LANGUAGE.

Developing transaction-based applications can be costly and time-consuming. NCR set out to find something better than COBOL for their 700 programmers to use.

After several months of extensive testing, NCR found the right language. PROGRESS.

A 4GL DBMS that increased new development productivity over COBOL by as much as 350%.

With the other programming alternatives they tested, NCR found they could increase new development productivity by 200%. Which was impressive. But not nearly as impressive as the 350% realized by using PROGRESS.

PROGRESS helps save development time because it's a fully integrated, multi-user 4GL DBMS created expressly for building, modifying and customizing transaction-based applications. PROGRESS lets NCR's programmers quickly prototype an application, demonstrate it to users, then modify it to rapidly complete an application that meets their exact needs.

And since PROGRESS is a true 4GL, it doesn't require NCR's programmers to go back to a 3GL to complete the application. It has a natural syntax and requires far less code. Yet it still gives programmers complete control.

Plus they no longer have to worry about power failures or operator errors, since PROGRESS is completely crash-proof.

PROGRESS is also portable across different operating systems and machines. Applications developed with it have the flexibility to run on UNIX, XENIX, ULTRIX and MS-DOS. And that's important to NCR programmers, because they're using it to develop programs for warehousing, maintenance and parts distribution, small manufacturing systems, administrative control, and sales office automation projects, to name just a few applications.

In fact, PROGRESS is so simple and fast to use, programmers spend less time developing programs and more time getting work done.

Find out what NCR already knows. Talk to us about a test drive.

For just \$50, you can get a good idea of just how much PROGRESS can increase productivity in your company. Because we'll send you a Test Drive version of PROGRESS.

The PROGRESS Test Drive is a full-function version of PROGRESS limited only by database size, and it includes a

The following are trademarks of these companies: UNIX of AT&T, MS-DOS and XENIX of Microsoft Corp. ULTRIX of Digital Equipment Corporation.

working PROGRESS application. It comes with an easy-to-read booklet that shows you how to prototype an application quickly, and how simple it is to modify the application once it's finished.

If you have any questions during your Test Drive, feel free to call our technical support staff.

And if you don't feel PROGRESS is everything we said it is, don't worry. Because we'll gladly refund every single penny if you're not happy.

To receive your copy, call 1-800-FAST 4GL. In Mass., call 617-663-5000. Or send in the coupon.



Send me the PROGRESS Test Drive for \$50.* If it's not as fast as you say it is, I understand that I am entitled to a full refund anytime within 30 days of receipt.

CALL 1-800-FAST 4GL
IN MASS., CALL 617-663-5000
Telex: 509965

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Country _____ Telephone _____

Telex _____

Computer _____

Operating System _____

Enclosed is my: Check Visa MasterCard

Card Number _____ Exp. _____

MasterCard Interbank Number _____

Signature _____

*Shipping additional for international orders.



47 MANNING ROAD, BILLERICA, MA 01821 617-663-5000 CW9186

PROGRESS

FASTEST FROM START TO FINISH



WHEN YOU'RE ABOUT TO SIGN A CHECK FOR A MILLION DOLLARS WORTH OF SOFTWARE, WHAT THOUGHTS GO THROUGH YOUR MIND?

It's natural to lose a little sleep when you're the person responsible for choosing a software company.

But if the company you choose is McCormack & Dodge, your nights can be a little more peaceful.

You can rest assured knowing three things about us. First, that we're a support-intensive company. We train, we service, we get you up and running in less time than you'd ever believe. And

when a problem comes up years from now, we're there to make things right.

Ask around and you'll see this isn't just a sales claim. Users give us exceptionally high satisfaction ratings.

Second, you can be confident about our products. They've always been rated the most advanced in the field, and never more than now. Our line of financial, human resources and application development software has

expanded to include a full range of manufacturing packages. While our Millennium borderless environment continues to outperform all of its imitators.

Third, you can count on M&D for stability, because we're part of Dun & Bradstreet, a blue chip success story for nearly a century and a half.

So, before you go signing any big checks, write yourself a memo.

To contact McCormack & Dodge,

McCormack & Dodge

 a company of
The Dun & Bradstreet Corporation

McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760, 1-800-343-0325

